COMPAQ

AlphaServer GS80/160/320

Site Preparation

Order Number: EK-GS320-SP. C01

This manual is for customers and service personnel who intend
to install a *Compaq AlphaServer* GS80/160/320 system.

Compaq Computer Corporation

FCC Notice

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Any modifications to this device—unless expressly approved by the manufacturer—can void the user's authority to operate this equipment under part 15 of the FCC rules.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

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環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Japanese Notice

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妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

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Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

EN55022 (CISPR 22) - Electromagnetic Interference

EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

EN60950 (IEC950) - Product Safety

Warning!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention!

Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques spécifiques appropriées.

Contents

Tables

Preface

Intended Audience

This manual is for customers who intend to install an *AlphaServer* GS80/160/320 system. It gives system specifications and site requirements in terms of space, power, and environmental conditions.

Document Structure

This manual has two chapters.

- **Chapter 1, Overview,** provides a conceptual introduction to the systems.

- **Chapter 2, System Specifications,** gives system dimensions, power and environmental requirements, as well as the weights of fully configured systems.

Documentation Titles

Table 1   Compaq AlphaServer GS80/160/320 Documentation

Title	Order Number
QA–6GAAA–G8	AlphaServer GS80/160/320 Documentation Kit
EK–GS320–UG	*AlphaServer GS80/160/320 User's Guide*
EK–GS320–RM	*AlphaServer GS80/160/320 Firmware Reference Manual*
EK–GSPAR–RM	*AlphaServer GS80/160/320 Getting Started with Partitions*
EK–GS320–IN	*AlphaServer GS160/320 Installation Guide*
EK–GSR80–IN	*AlphaServer GS80 Installation Guide*
AG–RKSWB–BE	AlphaServer GS80/160/320 User Information CD (HTML files)
AG–RLVJA–BE	AlphaServer GS80/160/320 User Information CD (translations)
QA–6GAAB–G8	AlphaServer GS80/160/320 Service Documentation Kit
EK–GS320–SV	*AlphaServer GS80/160/320 Service Manual*
EK–GS320–RM	*AlphaServer GS80/160/320 Firmware Reference Manual*
AG–RKSZ*–BE	AlphaServer GS80/160/320 Service Information CD
EK–GSCON–IN	*AlphaServer GS80/160/320 System Management Console Installation and User's Guide*
EK–GS320–UP	*AlphaServer GS160/320 Upgrade Manual*
EK–GSR80–UP	*AlphaServer GS80 Upgrade Manual*
EK–GS320–SP	*AlphaServer GS80/160/320 Site Preparation*

Information on the Internet

Visit the Compaq Web site at www.compaq.com/alphaserver/site_index.html for service tools and more information about the *AlphaServer* GS80/160/320 systems.

Chapter 1
Overview

The *AlphaServer* GS80, GS160, and GS320 systems are high-performance server platforms designed for enterprise-level applications. They are distinguished by their versatility and high degree of scalability and expandability.

These powerful, switch-based systems use four Alpha microprocessors per quad building block (QBB). Two QBBs paired back-to-back and rotated 180° with reference to each other form a system box. Each QBB backplane contains a switch that acts as an interconnect between the CPU modules, memory modules, I/O riser modules, and the global port module.

1.1 The Systems

The GS80 is a rack system whereas the GS160 and GS320 are box-based systems.

1.1.1 GS80 System

The GS80 system is contained in a single cabinet. It is a drawer-based system consisting of one or two drawers. Each drawer contains one QBB with up to four CPU modules and up to four memory modules. In a two-drawer system a distribution board connects the two QBBs through their global ports.

The system cabinet of the GS80 also contains the power supplies and accommodates one PCI box, a storage shelf, and the OCP (operator control panel). An expander cabinet can house additional PCI boxes and storage shelves.

1.1.2 GS160/320 System

The GS160/320 system consists of a power cabinet and one system cabinet (GS160) or two system cabinets (GS320), depending on the configuration. The power cabinet contains the power supplies, the I/O components—the PCI boxes and storage units—and the OCP. The system cabinets house the system boxes that carry interconnect modules as well as CPU and memory modules.

The system cabinet can be configured with one or two system boxes. The first system box is located in the lower cavity of the cabinet and the second system box is inserted in the upper cavity. A fully configured system consists of a power cabinet and two system cabinets—system cabinet 1 and system cabinet 2—each system cabinet containing two system boxes.

In a single system box system a distribution board interfaces the two QBBs directly through their global ports. In configurations with more than one system box a hierarchical switch replaces the distribution board and adds a second level switch to route information between the system boxes.

Additional PCI boxes and storage shelves can be accommodated in expander cabinets that can be attached to either side of the system.

1.2   System Diagrams

1.2.1   Block Diagrams

Figure 1–1 shows a block diagram of a two-drawer GS80 system. A distribution board makes the interconnect between the two drawers (QBBs) through their global ports.

Figure 1–1   Two-Drawer GS80 Block Diagram

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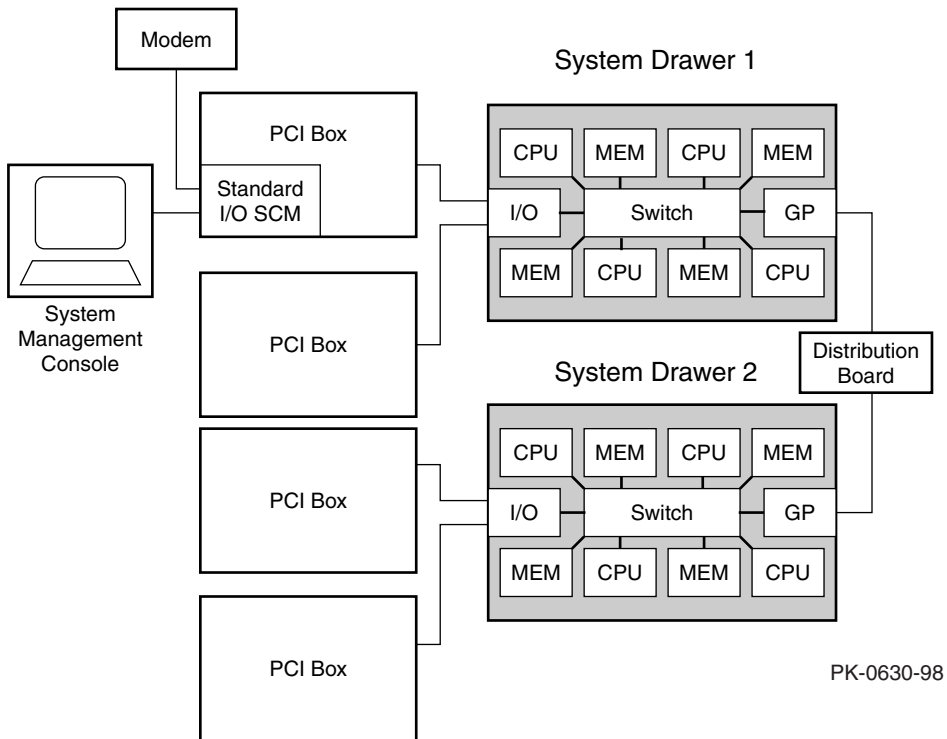
Figure 1–2 shows the block diagram of a GS160 system with a single system box installed. A distribution board makes the interconnect between the QBBs through their global ports.

Figure 1–2 GS160 Block Diagram

PK-0601-98
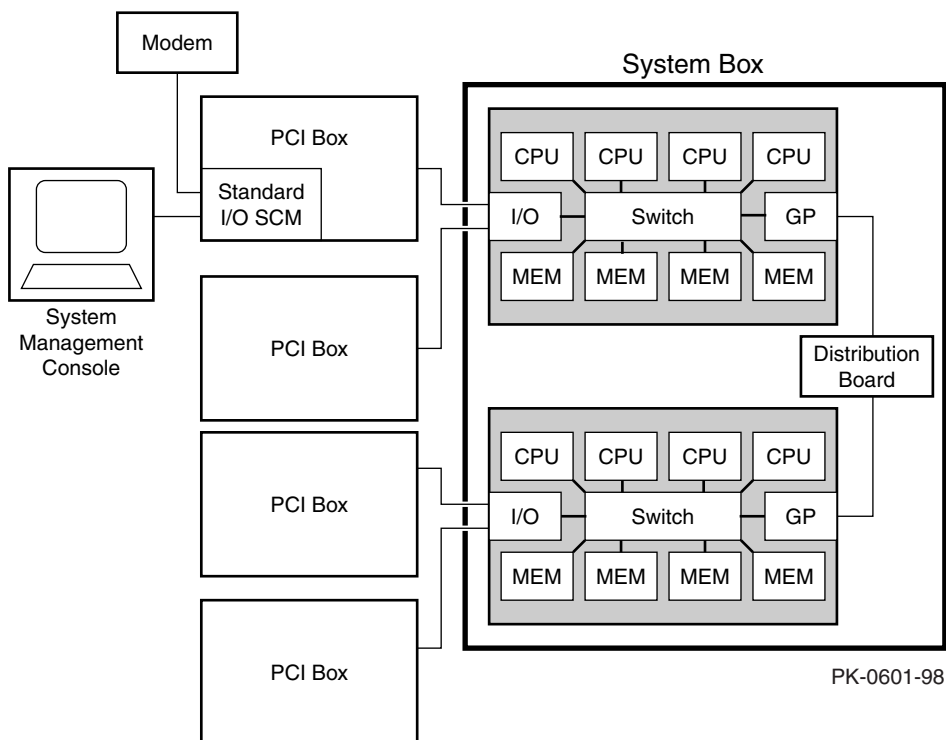
Figure 1–3 shows a block diagram of a GS160 with two system boxes. A hierarchical switch makes the interconnect between the QBBs in the two system boxes through their global ports.

Figure 1–3   GS160 Block Diagram

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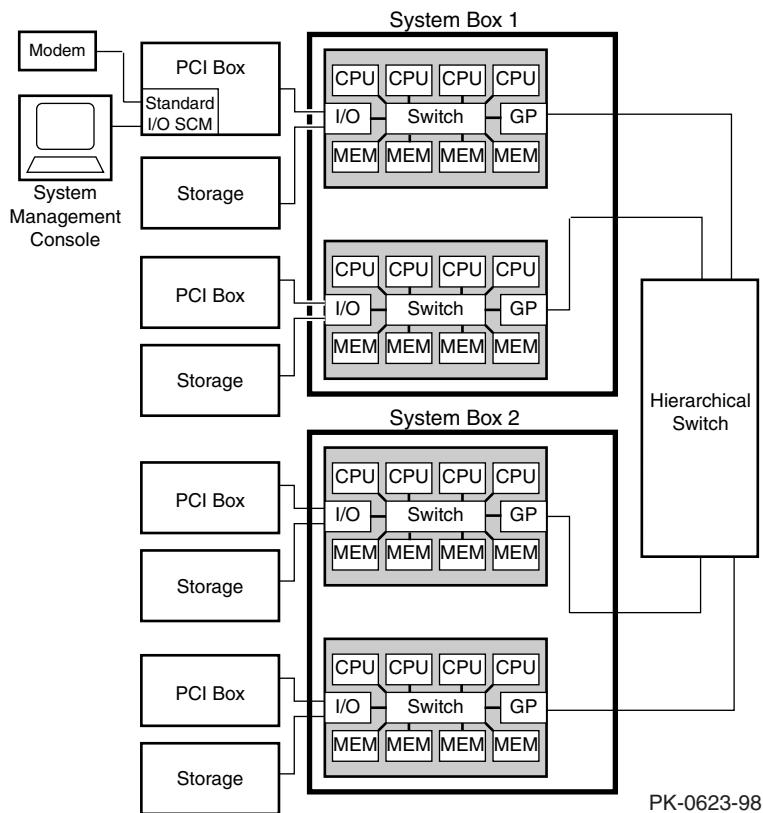
Figure 1–4 shows a block diagram of a GS320 with four system boxes. A hierarchical switch makes the interconnect between the QBBs in the four system boxes through their global ports.

Figure 1–4   GS320 Block Diagram
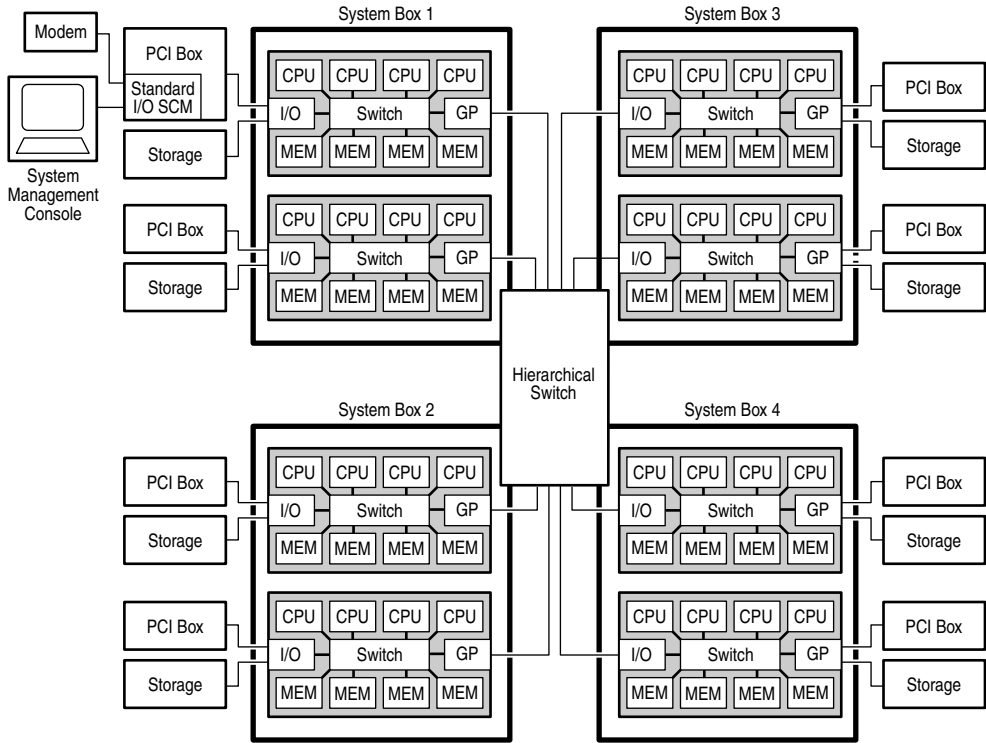
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1.2.2 Physical Diagrams

Figure 1–5 shows a physical diagram of the GS80 system.

Figure 1–5   GS80 Physical Diagram
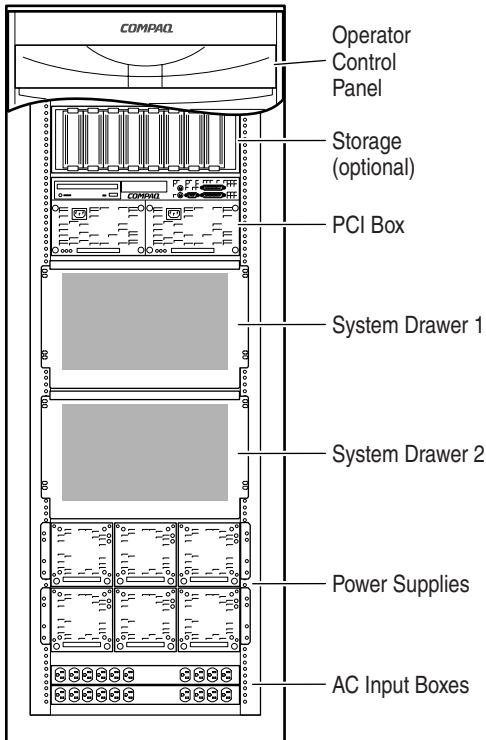
PK1280

Figure 1–6 shows a fully configured GS160 system.

Figure 1–6 GS160 Physical Diagram
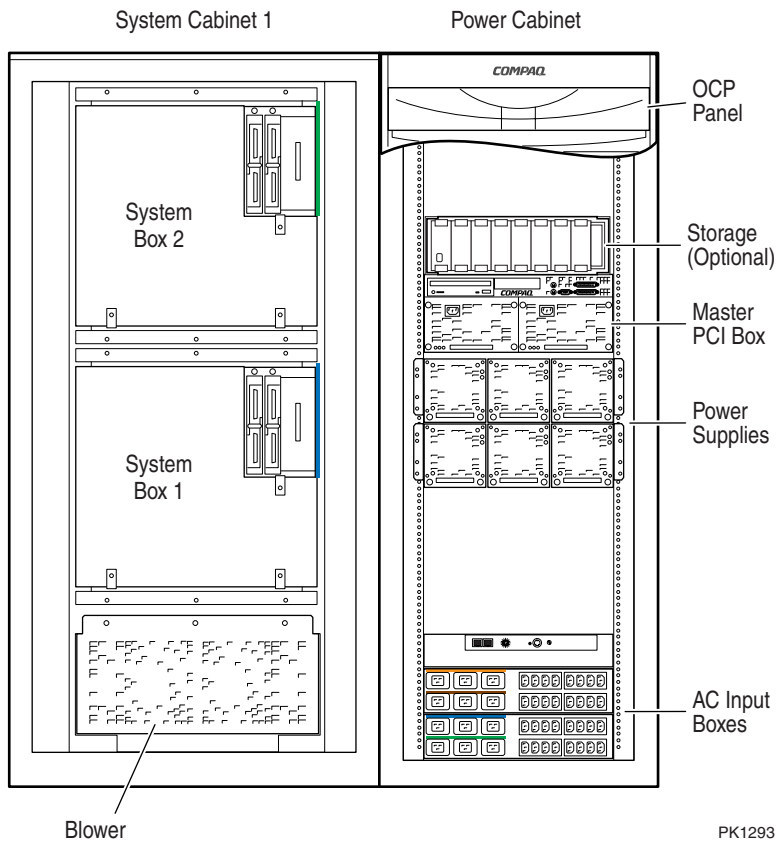
PK1293

Figure 1–7 shows a fully configured GS320 system.

Figure 1–7   GS320 Physical Diagram

System Cabinet 2   System Cabinet 1   Power Cabinet

System Box 4

System Box 2

System Box 3

System Box 1

OCP Panel

Storage (Optional)

Master PCI Box

Power Supplies

AC Input Boxes

Blowers
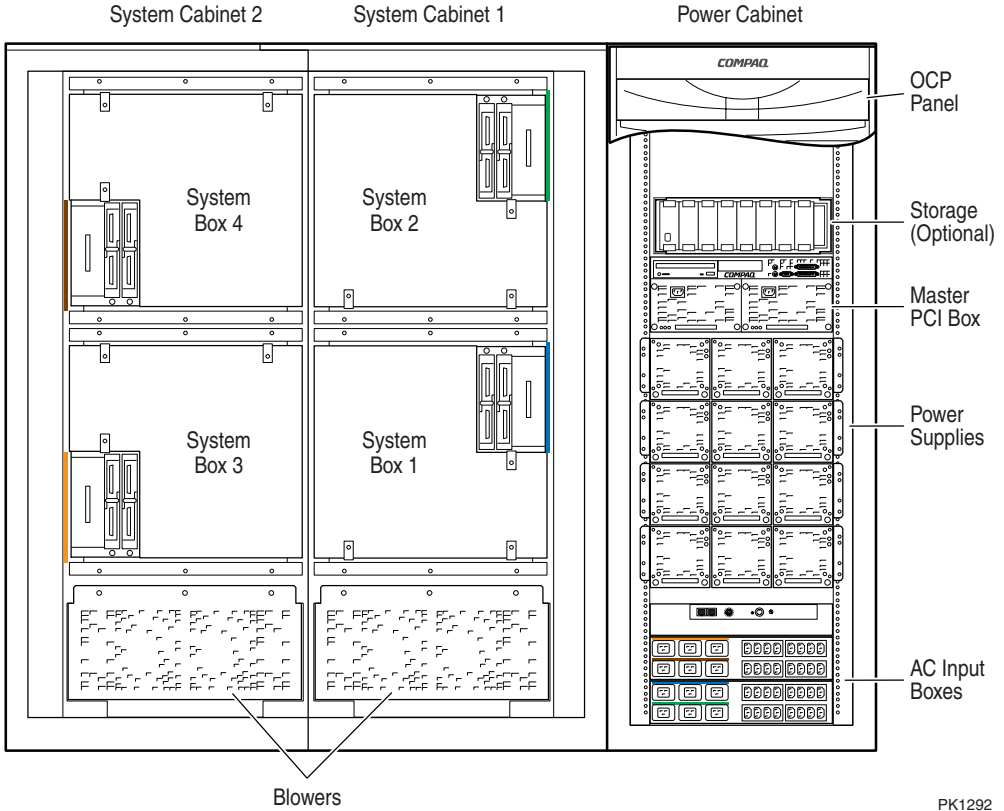
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Chapter 2
System Specifications

The basic unit of the GS80 system consists of a single cabinet that contains one or two drawers (QBBs), power supplies, a PCI box, and a storage shelf. Additional I/O and storage facilities are accommodated in an expander cabinet attached to the system unit.

In the GS160/320 line, the basic system is the GS160. It consists of a power cabinet and system cabinet 1. The power cabinet contains the power supplies, the I/O components—the PCI boxes and storage shelves—and the OCP (operator control panel). System cabinets house one or two system boxes. Each system box has two QBBs that are paired back-to-back and rotated 180^0 with reference to each other.

The basic system can be upgraded to contain two system boxes. An upgrade to three or four system boxes requires the addition of system cabinet 2 (GS320).

2.1   GS80

2.1.1   System Dimensions

Figure 2–1 shows the dimensions in a bird's-eye view of a system that includes an expander cabinet alongside the basic system unit.

Figure 2–1   Bird's-Eye View of a GS80 System
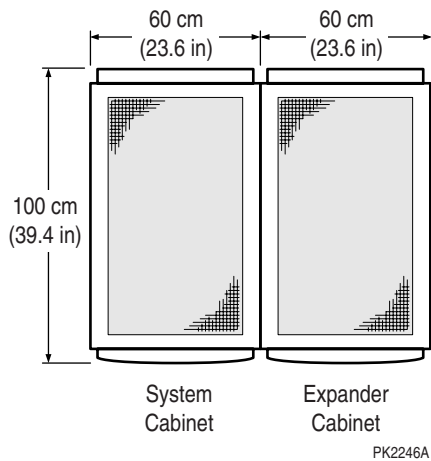
Table 2–1 gives the dimensions of a GS80 system.

Table 2–1 GS80 Dimensions

Cabinet (System or Expander)	Dimensions
Width	600 mm (23.6 in.)
Depth	1,000 mm (39.4 in.)
Height	1,700 mm (66.9 in.)

2.1.2 Power Specifications

Table 2–2 gives the power requirements of GS80 systems.

Table 2–2   Power Specifications of GS80 Systems

Power Requirements	U.S./Canada	U.S./Canada/Japan	Europe
Voltage, Vrms [1]	120	202	220–240
Frequency, Hz	50–60	50–60	50–60
Phases	1-phase 2 circuits 2-wire+GND	1-phase 1 circuit 2-wire+GND	1-phase 1 circuit 2-wire+GND
Maximum input current/circuit, Arms	1 drawer: 16 2 drawers: 17	1 drawer: 13 2 drawers: 20	1 drawer: 12 2 drawers: 18
Rating, Arms	30	30	32
Surge current amps peak	1 drawer: 60 2 drawers: 60	1 drawer: 160 2 drawers: 200	1 drawer: 190 2 drawers: 240
Total VA, volt-amps	1 drawer: 2600 2 drawers: 3900	1 drawer: 2600 2 drawers: 3900	1 drawer: 2600 2 drawers: 3900
Power cord length	15 ft/4.5 m	15 ft/4.5 m	15 ft/4.5 m
Power cap (system)	2 DEC 12-11193-00	1 DEC 12-16886-00	1 DEC 12-14379-07
Receptacle (site) (industry equiv.)	2 DEC 12-11194-00 2 NEMA L5-30R	1 DEC 12-19658-01 1 NEMA L6-30R	1 Hubbell 332R6W 1 IEC 309 (32A)

[1] The US/Canada model supports a nominal voltage of 115-127V. The Europe and US/Canada/Japan models support a nominal voltage of 200-240V.

Table 2–3 gives the heat dissipation in minimally as well as fully configured GS80 systems.

Table 2–3 Heat Dissipation in GS80 Systems

System Configuration	Heat Dissipation
GS80, one drawer **Minimal configuration:** Two power supplies, one CPU module, one memory module, one system I/O module, minimally configured PCI, one disk drive	1,150 W/3,800 Btu/hr
GS80, two drawers **Minimal configuration:** Four power supplies, one CPU module, one memory module, one system I/O module, minimally configured PCI, one disk drive	1,900 W/6,400 Btu/hr
GS80, one drawer **Full configuration:** Three power supplies, four CPU modules, four memory modules, two system I/O modules, one PCI box, one storage shelf with six disk drives	2,100 W/7,150 Btu/hr
GS80, two drawers **Full configuration:** Six power supplies, eight CPU modules, eight memory modules, four system I/O modules, one PCI box, one storage shelf with six disk drives	3,450 W/11,650 Btu/hr

See Table 2–9 for the power specifications of the I/O expander cabinet.

2.2 GS160/320

2.2.1 System Dimensions

Figure 2–2 shows the dimensions in a bird's-eye view of a system that includes two system cabinets, the power cabinet, a dual-AC cabinet and an expander cabinet operating through the I/O modules in system cabinet 1.

Figure 2–2 Bird's-Eye View of a GS320 System
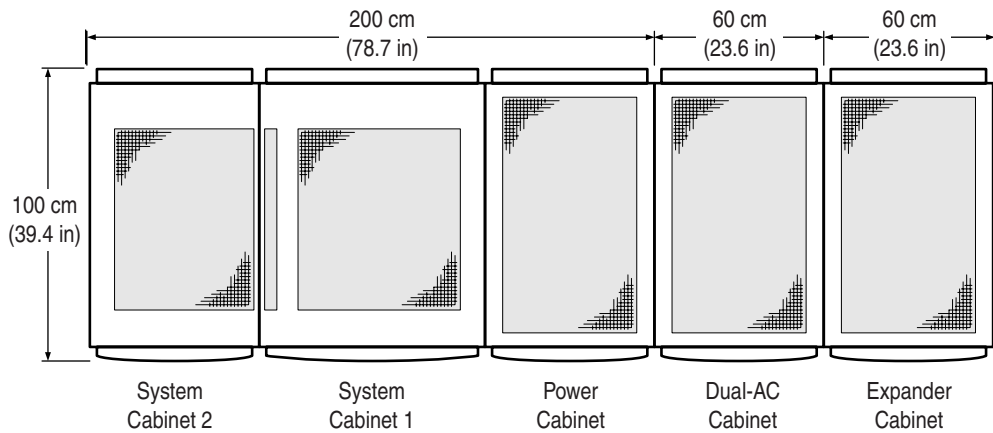
Table 2–4 shows the dimensions of system enclosures and expander cabinets.

NOTE: *The optional dual-AC cabinet is attached directly to the power cabinet and has the same dimensions as an expander cabinet.*

Table 2–4   GS160/320 Dimensions

System	Dimensions
GS160 enclosure (power cab + system cab 1)	
Width	1400 mm (55.1 in.)
Depth	1000 mm (39.4 in.)
Height	1700 mm (66.9 in.)
GS320 enclosure (power cab + system cab 1+ system cab 2)	
Width	2000 mm (78.7 in.)
Depth	1000 mm (39.4 in.)
Height	1700 mm (66.9 in.)
Expander cabinet	
Width	600 mm (23.6 in.)
Depth	1000 mm (39.4 in.)
Height	1700 mm (66.9 in.)
Dual-AC cabinet	
Width	600 mm (23.6 in.)
Depth	1000 mm (39.4 in.)
Height	1700 mm (66.9 in.)

2.2.2 Power Specifications

Table 2–5 through Table 2–8 give the power specifications for fully loaded GS160/320 systems for different regions.

Table 2–5 Power Specifications of a GS160 with One System Box

Specification	U.S./Canada/Japan		Europe
Voltage, Vrms [1]	120/208 or 202		380–415
Frequency, Hz	50–60		50–60
Phases	1 circuit 3-phase star or 3-wire+N+GND	1 circuit 3-phase delta 3-wire junc. GND or 4-wire-mid-GND	1 circuit 3-phase star 3-wire+N+GND
Power plug, quantity [2]	L21-30P, 1		IEC309 5P 32A, 1
Max input current/phase	18A		10A
Rating	30A		32A
Surge current	225A peak		150A peak
Total VA2 [3]	4,400		4,400
Total power [3]	4,360 watts		4,360 watts
Heat output [3]	14,900 Btu/hr		14,900 Btu/hr
Power cord length	15 ft/4.5 m		15 ft/4.5 m
Power cap (system)	1 DEC 12-12314-00		1 DEC 12-14379-
Receptacle (site) (industry equiv.)	1 DEC 12-12315-01 1 NEMA L21-30R		1 Hubbell 532R6W 1 IEC 309 (32A)

[1] The US/Canada/Japan model supports a three-phase star connected source with nominal voltage of 115-127V/200-220V or a three-phase delta connected source with a nominal voltage of 200-240V. The Europe model supports a three-phase star connected source with a nominal voltage of 200-240V/346-415V.

[2] The single-box GS160 system is equipped with a second power cord for future expansion. However, only one power cord is required for the GS160 system with one system box.

[3] Based on fully loaded system with two PCI boxes and one storage shelf in the power cabinet.

Table 2–6   Power Specifications of a GS160 with Two System Boxes

Specification	U.S./Canada/Japan		Europe
Voltage, Vrms [1]	120/208 or 202		380–415
Frequency, Hz	50–60		50–60
Phases	2 circuits 3-phase star or 3-wire+N+GND	2 circuits 3-phase delta 3-wire junct. GND or 4-wire-mid-GND	2 circuits 3-phase star 3-wire+N+GND
Power plug, quantity	L21-30P, 2		IEC309 5P 32A, 2
Maximum input current/phase	21A		13A
Rating	30A		32A
Surge current	170A peak		170A peak
Total VA [2]	6,800		6,800
Total power [2]	6,700 watts		6,700 watts
Heat output [2]	22,900 Btu/hr		22,900 Btu/hr
Power cord length	15 ft/4.5 m		15 ft/4.5 m
Power cap (system)	2 DEC 12-12314-00		2 DEC 12-14379-06
Receptacle (site) (industry equiv.)	2 DEC 12-12315-01 2 NEMA L21-30R		2 Hubbell 532R6W 2 IEC 309 (32A)

[1] The US/Canada/Japan model supports a three-phase star connected source with nominal voltage of 115-127V/200-220V or a three-phase delta connected source with a nominal voltage of 200-240V. The Europe model supports a three-phase star connected source with a nominal voltage of 200-240V/346-415V.

[2] Based on fully loaded system with two PCI boxes and one storage shelf in the power cabinet.

Table 2–7   Power Specifications of a GS320 with Three System Boxes

Specification	U.S./Canada/Japan		Europe
Voltage, Vrms [1]	120/208 or 202		380–415
Frequency, Hz	50–60		50–60
Phases	2 circuits 3-phase star 3-wire+N+GND	or	2 circuits 3-phase delta 3-wire junct. GND or 4-wire-mid-GND	3-phase star 2 circuits 3-wire+N+GND
Power plug, quantity	L21-30P, 2		IEC309 5P 32A, 2
Maximum input current/phase	21A		13A
Rating	30A		32A
Surge current	170A peak		170A peak
Total VA [2]	9,600		9,600
Total power [2]	9,500 watts		9,500 watts
Heat output [2]	32,500 Btu/hr		32,500 Btu/hr
Power cord length	15 ft/4.5 m		15 ft/4.5 m
Power cap (system)	2 DEC 12-12314-00		2 DEC 12-14379-06
Receptacle (site) (industry equiv.)	2 DEC 12-12315-01 2 NEMA L21-30R		2 Hubbell 532R6W 2 IEC 309 (32A)

[1] The US/Canada/Japan model supports a three-phase star connected source with nominal voltage of 115-127V/200-220V or a three-phase delta connected source with a nominal voltage of 200-240V. The Europe model supports a three-phase star connected source with a nominal voltage of 200-240V/346-415V.

[2] Based on fully loaded system with two PCI boxes and one storage shelf in the power cabinet.

Table 2–8 Power Specifications of a GS320 with Four System Boxes

Specification	U.S./Canada/Japan		Europe
Voltage, Vrms	120/208 or 202		380–415
Frequency, Hz	50–60		50–60
Phases	2 circuit 3-phase star or 3-wire+N+GND	2 circuit 3-phase delta 3-wire junct. GND or 4-wire-mid-GND	2 circuit 3-phase star 3-wire+N+GND
Power plug, quantity	L21-30P, 2		IEC309 5P 32A, 2
Maximum input current/phase	24A		15A
Rating	30A		32A
Surge current	170A peak		170A peak
Total VA [1]	12,000		12,000
Total power [1]	11,900 watts		11,900 watts
Heat output [1]	40,600 Btu/hr		40,600 Btu/hr
Power cord length	15 ft/4.5 m		15 ft/4.5 m
Power cap (system)	2 DEC 12-12314-00		2 DEC 12-14379-06
Receptacle (site) (industry equiv.)	2 DEC 12-12315-01 2 NEMA L21-30R		2 Hubbell 532R6W 2 IEC 309 (32A)

[1] The US/Canada/Japan model supports a three-phase star connected source with nominal voltage of 115-127V/200-220V or a three-phase delta connected source with a nominal voltage of 200-240V. The Europe model supports a three-phase star connected source with a nominal voltage of 200-240V/346-415V.

[2] Based on fully loaded system with two PCI boxes and one storage shelf in the power cabinet.

Table 2–9 gives the power specifications for the fully configured GS160/320 I/O expander cabinet for different regions.

Table 2–9 Power Specifications of I/O Expander Cabinet

Specification	U.S./Canada	U.S./Canada/Japan	Europe
Voltage, Vrms [1]	120 (GS80 system)	200-240 (GS160/320 systems)	220/240 (GS160/320 systems)
Frequency, Hz	50–60	50–60	50–60
Phase	1-phase 2 circuits 2-wire+GND	1-phase 2 circuits 2-wire+GND	1-phase 2 circuits 2-wire+GND
Power plug, quantity	L5-30P, 2	L6-30P, 1	IEC309 3P 32A, 1
Maximum input current	22A	12A	11A
Total VA [2]	2,600	2,600	2,600
Rating	30A	30A	32A
Surge current	150A peak	150A peak	170A peak
Total power [2]	2,550	2,550	2,550
Heat output [2]	8,700 Btu/hr	8,700 Btu/hr	8,700 Btu/hr
Power cord length	15 ft/4.5 m	15 ft/4.5 m	15 ft/4.5 m
Power cap (system)	2 DEC 12-11193-00	2 DEC 12-16886-00	2 DEC 12-14379-07
Receptacle (site) (industry equiv.)	2 DEC 12-11194-00 2 NEMA L5-30R	2 DEC 12-19658-01 2 NEMA L6-30R	2 Hubbell 332R6W 2 IEC 309 (32A)

[1] The US/Canada model supports a nominal voltage of 115-127V. The Europe and US/Canada/Japan models support a nominal voltage of 200-240V.

[2] Based on fully configured expander cabinet that contains four PCI boxes and eight disk drives.

Table 2–10 gives the environmental specifications of the systems.

Table 2–10   GS80/160/320 Environmental Specifications

Variable	Specification
Temperature	
Operating	5 to 35º C (41 to 95º F)
Nonoperating	–40 to 66º C (–40 to 151º F)
Relative humidity (noncondensing)	
Operating	10–90%
Nonoperating	10–95%
Maximum altitude	
Operating	3050 m (10,000 ft)
Nonoperating	12,200 m (40,000 ft)
Minimum clearances	
Front operating	75 cm (29.5 in.)
Front service	75 cm (29.5 in.)
Rear operating	
System and power cabinets	75 cm (29.5 in.)
Expander cabinet	15 cm (6.0 in.)
Rear service	75 cm (29.5 in.)
Left side operating	None
Left side service	75 cm (29.5 in.)
Right side operating	None
Right side service	None

2.3   System Weights

Table 2–11 gives the weights of fully configured GS80/160/320 systems.

Table 2–11   Weights of Fully Configured Systems

System	Weight
GS80 (1 or 2 drawers)	260 kg (575 lb)
GS160 with one system box	517 kg (1,140 lb)
GS160 with two system boxes	603 kg (1,330 lb)
GS320 with three system boxes	897 kg (1,978 lb)
GS320 with four system boxes	983 kg (2,168 lb)
Expander cabinet[1]	320 kg (700 lb)

[1] Fully configured expander cabinet contains three PCI boxes and 24 disk drives.

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