Sun StorEdge™ A7000 Physical Planning Manual

THE NETWORK IS THE COMPUTER™

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Declaration of Conformity

Compliance ID: 1660

Product Name: Sun StorEdge A7000

EMC

European Union
This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

EN55022 / CISPR22 (1985)		Class A
EN50082-1	IEC801-2 (1991)	4 kV (Direct), 8 kV (Air)
	IEC801-3 (1984)	3 V/m
	IEC801-4 (1988)	1.0 kV Power Lines, 0.5 kV Signal Lines

Safety

This equipment complies with the following requirements of Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

EN60950/IEC950

EN60950 w/ Nordic Deviations

Supplementary Information:
This product was tested and complies with all the requirements for the CE Mark.

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Declaration of Conformity

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Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

On – Applies AC power to the system.

Depending on the type of power switch your device has, one of the following symbols may be used:

Off – Removes AC power from the system.

Standby – The On/Standby switch is in the *standby* position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

The following caution applies only to devices with a **Standby** power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery

Caution – On Sun CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, MK48T08, M48T02-200PC1, or M48T02-XXXPCZ. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

System Unit Cover

You must remove the cover of your Sun computer system unit in order to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering up your computer system.

Caution – Do not operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

CD-ROM

Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

Ein – Setzt das System unter Wechselstrom.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

Wartezustand (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie

Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, MK48T08, M48T02-200PC1, oder M48T02-XXXPCZ). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Gehäuseabdeckung

Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.

Achtung – Bei Betrieb des Systems ohne obere Abdeckung besteht die Gefahr von Stromschlag und Systemschäden.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

CD-ROM

Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :

Attention : risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

Attention : surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

Attention : présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

MARCHE – Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

ARRET – Votre système est hors tension (courant alternatif).

VEILLEUSE – L'interrupteur Marche / Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

Attention : pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Conformité SELV

Sécurité : les raccordements E / S sont conformes aux normes SELV.

Connexion du cordon d'alimentation

Attention : les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.

Attention : tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.

Attention : votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

Attention : le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium

Attention : sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, MK48T08, M48T02-200PC1, ou M48T02-XXXPCZ.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Couvercle

Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.

Attention : il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

CD-ROM

Attention – L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

Precaución – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

Precaución – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Encendido – Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

Apagado – Elimina la alimentación de CA del sistema.

En espera – El interruptor de Encendido/En espera se ha colocado en la posición de *En espera*.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada / salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

Precaución – Los productos Sun están diseñados para
trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio

Precaución – En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, MK48T08, M48T02-200PC1, o M48T02-XXXPCZ. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Tapa de la unidad del sistema

Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.

Precaución – Es peligroso hacer funcionar los productos Sun sin la tapa superior colocada. El hecho de no tener en cuenta esta precaución puede ocasionar daños personales o perjudicar el funcionamiento del equipo.

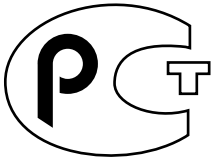
Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

CD-ROM

Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark



Nordic Lithium Battery Cautions

Norge

A D V A R S E L – Litiumbatteri — Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Sverige

VARNING – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Danmark

ADVARSEL! – Litiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Suomi

VAROITUS – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) - Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

1. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICES-003 Class B Notice - Avis NMB-003, Classe B

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

VCCI 基準について

第一種VCCI基準について

第一種VCCIの表示があるワークステーションおよびオプション製品は、第一種情報装置です。これらの製品には、下記の項目が該当します。

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BSMI Class A Notice

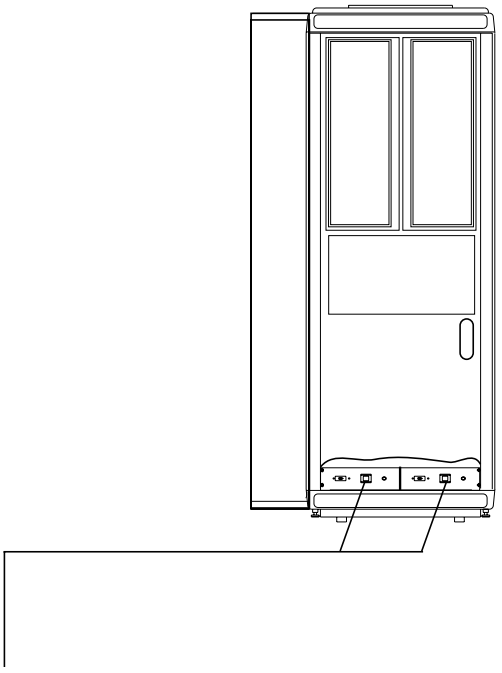
The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，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。

WARNING: AVERTISSEMENT: ACHTUNG:

- No AC disconnect switch in equipment. A disconnect device must be provided on the wall.
- L'appareil ne comporte pas d'interrupteur c.a. Un interrupteur doit être installé au mur.
- Kein ausschaltbarer Ws-Schalter am Gerät. Ein solcher Schalter muß in der Installation angebracht werden.

- Versorgungs spannung:
  - Kein Netzschalter am Gerät, CB in der Installation öffnet bei Gefahr.
  - An die Anschluß leitung muß ein JEC Stecker Tye B angeschlossen werden.



- Shown are the main disconnect switches for this equipment. All other switches with "IO" markings power down individual components.
- L'interrupteur principal de cet appareil est illustré. Les autres interrupteurs marqués "IO" coupent l'alimentation aux composants individuels.
- Dargestellt ist der Hauptschalter dieses Geräts. Alle anderen mit "IO" versehenen Schalter schalten die einzelnen Komponenten aus.

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Preface

This manual provides site planning and preparation information for the installation of the Sun StorEdge™ A7000 Intelligent Storage Server™, including specifications for site facilities, input power, and environmental conditions. It is intended for customers, Sun installation planners, and Sun-trained service personnel. This manual is also a guide for the preparation of most computer rooms, although it may not address local site concerns.

How This Book Is Organized

This manual provides general guidelines to effectively and efficiently prepare your site for the installation of the A7000. The manual is organized as follows:

Chapter 1 provides an overview of the requirements for planning and preparing for the installation of Sun equipment.

Chapter 2 defines the factors to be considered in site selection.

Chapter 3 provides general recommendations for raised floors and air conditioning in the computer room.

Chapter 4 provides the requirements for input power to Sun storage servers.

Chapter 5 provides specific facility requirements to implement Sun remote support.

Chapter 6 provides specific requirements for the A7000, power conditioning unit, and bypass switch. Included are specification summaries, frame dimensions, weights, server layout information, and cabling requirements.

Chapter 7 explains how to plan the physical layout of the installation, plan for the wiring requirements, and perform the electrical pre-installation

Appendix A provides a quick reference to units-of-measure and fractional decimal equivalent conversions.

Appendix B provides physical planning information needed to determine if the floor plan of a prospective site can accommodate the proposed Sun storage servers. This appendix contains scaled templates for planning installations.

Appendix C provides a preinstallation and planning information checklist.

Related Documentation

TABLE P-1 Related Documentation

Application	Title	Part Number
Installation	*Sun StorEdge A7000 Installation Guide*	805-4632
Service	*StorEdge A7000 Service Manual*	805-6489
	Best Power Technology UNITY/I Installation Manual (shipped with PCU)	N/A

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CHAPTER 1

Preparing for Installation

This chapter provides an overview of planning and preparation for StorEdge A7000 installation at a customer site.

1.1 Customer Responsibilities

During the planning and preparation for A7000 installation at a customer site, the customer is responsible for:

- Providing suitable space for the A7000 installation
- Providing adequate power facilities
- Maintaining the server environment before installation
- Maintaining the room environment for the server during and after installation
- Following remote support strategy

Space and environment are important throughout the life of electronic computing equipment. Protection from harmful environmental factors is important during building, warehousing, transporting, and productive use. Electronic equipment has special packing for shipping and receives special handling during transportation; the manufacturing environment and packing for shipping are the responsibilities of the product manufacturer. It is the customer's responsibility to ensure that space is available within a correct environment for new equipment upon delivery. Refer to Chapter 2 for guidance concerning site selection.

For sustained performance in certain locations, the A7000 requires controlled environmental conditions by using air conditioning. It is the customer's responsibility to monitor this environment to ensure continued conformance to recommended environmental specifications. Refer to Chapter 3 for more information.

Adequate power is necessary for the reliable function of electronic equipment and for the safety of the customer's installation. The customer is responsible for procuring, installing, and maintaining adequate power to the equipment. Refer to Chapter 4 for input electrical power and grounding requirements.

For remote support, a telephone connection to a Sun Worldwide Support Center can be established through the A7000 modem (when such connection is authorized by the customer). When ordering communications facilities, the customer must specify the receptacles required to terminate the line.

The customer must also provide the telephone company with specific registration information for each device to be directly attached to the switched-telephone network. This information will be provided by Sun for installations in the U.S.A. and Canada. Refer to Chapter 5 for more information about Sun remote support facilities and communications needs.

A typical A7000 installation comprises:

- one A7000 storage server
- one or power conditioning unit PCUs
- one bypass switch (allows power to bypass the PCU)

Some installation also include a High-Speed Data Array (HSDA) expansion cabinet, which requires its own PCU and bypass switch. Refer to Chapter 6 for details specifications on these items and their relationship to each other in the installation.

The customer is encouraged to seek assistance from an independent consultant or from a Sun representative if questions arise.

1.2 Planning for Installation

Successful installation requires careful planning and supervision. Proper planning will help provide for a more efficient server installation and greater server reliability, availability, and serviceability.

The customer should schedule and complete all pre-installation activities before the equipment is delivered. To prevent an adverse impact on performance and reliability, environmental conditions during shipping, storage, and operation of the server must be maintained within the specified limits. Both the room environment and the underfloor environment must be maintained within the limits defined in this manual.

The customer is responsible for maintaining the server environment to the specifications in this manual. The customer may request assistance from a Sun representative to analyze the environment.

An installation group should be formed to work with the Sun representative. This Sun representative will provide planning assistance throughout the installation planning phases. The group should prepare a list of tasks and components required for a successful installation. This list should include server components and any support equipment needed for testing prior to turnover.

The following is a suggested planning sequence for installation of the A7000:

- Phase I (three to six months before delivery)
  - Make a preliminary layout of the installation.
  - Review the power and the heating, ventilation, and air-conditioning (HVAC) requirements.
  - Consult a licensed electrician about power and wiring requirements.
  - Order a bypass switch for the A7000. Order a second bypass switches if an HSDA expansion cabinet will be installed.
  - Order a a pair of receptacles for the A7000 AC power cord plugs. Order a second pair of receptacles if an HSDA expansion cabinet will be installed.
  - Order any additional support equipment indicated by the power and HVAC review.
  - Verify with a Sun representative that all server units in the specified configuration and all cables of the required length have been ordered.
- Phase II (one month before delivery)
  - Make a final layout of the installation and review the layout with your Sun representative.

- Select key installation personnel, including a licensed electrician to perform electrical tasks.
- Arrange for installation training with your Sun representative.

- Phase III (one week before delivery)
  - Verify that electrical service wiring has been installed at the server's predetermined location. Refer to the respective product specifications for detailed requirements.
  - Verify that any additional support equipment ordered in Phase I is properly installed and operational.
- Phase IV (a few days before delivery or concurrent with installation):
  A licensed electrician must:
  - Install bypass switch(es) and connect it to the building service panel.
  - Connect a load center(s) to the bypass switch(es).
  - Install the receptacles for the AC power plugs in junction box(es) and connect them to the load center(s).
- Phase V (at installation time)
  At installation time, the Sun representative will:
  - Supervise the delivery and unpacking of the equipment.
  - Conduct an inventory of the delivered equipment using the shipping manifest and bill of materials.
  - Install or supervise the installation of server interconnect cables under the subfloor, if applicable.
  - Verify that a licensed electrician has performed all necessary tasks described in Phase IV.
  - Verify that a licensed electrician connects input power as needed for two independent input power sources and that phase rotation (if required) and that voltage are correct.
  - Place or supervise the placing of the server units in their predetermined locations according to the layout plan.
  - Verify that a licensed electrician connects the bypass switch(es) to the PCU(s).
  - Configure or install all server components.
  - Observe that the customer's air-conditioning system is balanced once the A7000 is powered on.

CHAPTER 2

Site Selection Requirements

This chapter defines the StorEdge A7000 site selection requirements. Installation planning includes:

Make a study of the equipment requirements and the proposed server location. This study should help determine what alterations or additions, if any, are needed to prepare the computer room for the server installation.

2.1 External Location

Assign one section of the server location survey to the external environment to identify potential sources of electrical or environmental concerns, including:

- Potential flooding areas
- Earthquake areas
- Frequent thunderstorms
- Electric utility stability
- High level of electromagnetic radiation fields (for example, radio, TV, or radar transmitters, power lines)
- Potentially toxic or corrosive pollution from nearby industries

Exposure to any of the above conditions should be recognized, investigated, and addressed.

2.2 Internal Location

Electronic equipment is sensitive to corrosion, vibration, and electrical interference. Computer equipment should not be located near areas where hazardous materials are manufactured, used, or stored. When the server must be located near such an environment, consider additional environmental controls.

2.2.1 Floor Loading

The computer room floor structure must be able to support the weight of all equipment cables, raised flooring, and personnel in the service area. The A7000 typically has a floor load of not more than 638 kilograms per square meter (131 pounds per square foot). Chapter 6 describes the A7000's weight.

The customer must consult a qualified building inspector or civil engineer if the floor load does not meet the 638 kilograms per square meter (131 pounds per square foot) rating. The inspector or engineer should calculate the actual floor load and verify that the weight can be supported.

2.2.2 Bypass Switch Location

An AC disconnect device, typically a bypass switch manufactured by Best Power Technologies, must be installed in a location where it will be at all times in sight of the PCU to which it is connected. Make sure the costumer selects a location for the server that makes this possible. Chapter 6 describes installation requirement for bypass switches.

2.2.3 Computer Room Access

Define an access route from the loading dock to the data processing facility. Perform a survey to ensure that the loading dock, passageways, elevators, and stairways can accommodate Sun equipment.

The A7000 server is the largest item shipping for an A7000 installation. In its shipping package, the A7000 is 1.3 m (51 in.) wide, 2.21 m (87 in.) high, and 1.2 m (47 in.) deep. Without its shipping package, the A7000 system is 1.1 m (43 in.) wide, 2.01 m (79 in.) high, and 1.1 m (43 in.) deep.

Hallways and doors must be wide enough to allow equipment passage and turns. Overhead clearance must be sufficient to accommodate Sun equipment. Elevators must have sufficient lift capacity to support the equipment being installed. Ramps should have an incline no greater than 15 degrees (268 mm/meter, 3 7/32 in./foot).

2.2.4 Utilities

Power, HVAC, and telephone requirements are defined by each product specification. It is the customer's responsibility to ensure that those facilities are provided.

2.2.5 Health, Safety, and Fire

Personnel safety standards are governed by local and national codes. If a question arises, check appropriate standards.

2.2.6 Personnel Safety

Safety is a vital factor when planning for computer equipment installation. This consideration is reflected in the choice of the equipment location, building materials, fire prevention equipment, air-conditioning and electrical systems, and personnel training.

If windows are required, install shatterproof windows in the computer room to improve the safety of personnel and equipment.

If an inconsistency exists between local and national regulations, the more stringent of the recommendations or regulations takes precedence.

2.2.7 Fire Precautions

Buildings or rooms for the server should be constructed of noncombustible or fire-resistant materials (minimum of one-hour-fire-resistance rating). The outside walls of the room should extend from the structural floor to the structural ceiling.

Consult the *Standard for the Protection of Electronic Computer/Data Processing Equipment*, National Fire Protection Association, Inc. (NFPA 75), the *National Electrical Code* (NFPA 70), and appropriate local and national codes.

2.2.8 Fire Prevention Equipment in a Computer Room

The proper installation of fire and smoke detection systems, and fire extinguishing equipment requires specialized experience and knowledge. Consult local experts during the planning stages. Insurance underwriters and local fire and building authorities recommendations should be followed as closely as possible.

Install the following items in the computer room as added safety measures:

- A fire detection system should be installed to provide early warning of a fire in computer rooms and storage areas for recorded media. It should activate both an audible and a visual alarm in the rooms and be monitored at a central station.
- A portable Halon fire extinguisher should be installed in the computer room. Halon will not damage expensive computer equipment. The recommended extinguisher is a 13- pound Halon 1211. If the extinguisher is 13 pounds or larger it will have an A/B/C rating. With this type of rating it can be used on combustible materials, flammable liquids, and electrical fires. A smaller extinguisher will not have an A (combustible materials) rating.

Extinguishers should be readily accessible to individuals in the area, and extinguisher locations should be marked so they are visible from overhead.

When portable fire extinguishers are used as the primary extinguishing agent, locate a stand-pipe or hose unit within effective range of the computer room as a secondary extinguishing agent.

If an automatic fire extinguishing system is either required or preferred, consider a Halon 1301 system. If a Halon 1301 system is installed, include a time-delay feature that allows time to evaluate the emergency and to evacuate the room before the system activates. A cross-zoned detection system is recommended.

Waste material containers should be of metal construction with flame-suppressant lids.

Combustible materials (packaging materials, boxes, paper, and so forth) need to be maintained as low as possible within the computer room. Printer paper and extra cables should be stored outside the computer room.

CHAPTER 3

Computer Room Environment

This chapter defines the recommended room environment for the StorEdge A7000.

3.1 General Information

Consider these factors when choosing or designing facilities for the storage server:

- Equipment location and layout that allow efficient use, easy maintenance, and future expansion
- Facility construction that provides a suitable operating environment and protection from fire, contamination, or other hazards
- Space and facilities for Sun support personnel and equipment

The customer is responsible for maintaining the room environment according to the specifications defined. Environmental conditions for the room and underfloor must be maintained within the acceptable limits to prevent adverse impact on performance and reliability. The customer must monitor the environment to ensure continued conformance to recommended environmental specifications. The customer may request assistance from a Sun representative to analyze the environment.

3.2 Floors

The storage server can be installed with or without raised floors. Raised floors allow cables to be located safely beneath the floor. If the facility does not have raised floors, route the interconnecting cables in on-floor cable conduits.

3.2.1 Description

The raised floor system should consist of removable panels or panels on a stringer grid system, supported by adjustable steel pedestal assemblies. The raised floor can be constructed of steel, aluminum, or fire-retardant wood. The purpose of the raised floor system is to:

- Allow for future layout changes with minimum cost
- Protect interconnecting cables and power receptacles
- Provide safety for personnel
- Support the total weight of the system and service area loading

3.2.2 Recommendations

Chapter 6 specifies weight of the A7000, the optional HDSA expansion cabinet, and the PCU(s). The raised floor must meet the following guidelines:

- Make sure there is adequate floor clearance and room height. The flooring should be high enough to allow underfloor routing of cables. The recommended minimum floor clearance is 30.5 cm (12 in). Allow an additional 7.6 cm (3 in) for cables and connectors. A floor clearance of 46 cm (18 in) is recommended for new construction. The finished floor-to-ceiling height should be a minimum of 2.44 meters (8 feet).
- Use panel supports. Additional panel support may be required to restore the structural integrity of a raised floor panel that has been cut for air opening, cable entry, and so on. Nonstringered raised floors may also require lateral support to prevent floor tile movement.
- Make sure there is adequate draining. The subfloor must have adequate drainage to prevent flooding and trapping of water beneath the raised floor.
- Seal cement. It prevents the formation of particulates.
- Be careful if you have a metallic floor. To avoid an electrical hazard when using a metallic floor, make sure no metal or conductive material is exposed to the walking surface.
- Eliminate sharp edges on all floor cutouts where cables pass. For wood or similar core material, cover all cut edges with metal or plastic clips or grommets so that none of the core is exposed (see NFPA 75 requirements).
- Do not use asphalt tiles. They are not recommended because they produce dust that may cause equipment malfunction.
- Avoid carpeting. Carpeting is not recommended because it produces and holds dust, and can contribute to the buildup of electrostatic charges on people and equipment.

3.2.3 Raised Floor Construction Recommendations

Most raised floors are composed of 60 cm (International / Metric) or 24 in. (Domestic / American Standard) square floor tiles. The maximum panel size should not exceed 60 by 90 cm (International / Metric) or 24 by 36 in. (Domestic / American Standard). The panels should have a flame spread rating of 15 or better when tested according to the *American Society for Testing and Materials (ASTM) Standard* E 84.

Recommendations for the raised floor system, individual floor tile panels, pedestal assemblies, and stringers are as follows:

- The overall floor should be level within ±0.25 cm (±0.10 in) and should be level within ±0.16 cm (±0.06 in) in a length of 3.1 m (10 ft).
- The raised floor system should be capable of supporting a concentrated load of 454 kg per 6.45 sq cm (1000 lb per sq in) with a deflection not to exceed 0.203 cm (0.08 in) and a permanent set not to exceed 0.025 cm (0.01 in).
- The floor tile panels must be capable of supporting a total of 1134 kg (2500 lb) distributed evenly over four points. Each point is 6.45 sq cm (1 sq in) and is located at the corners of an imaginary 20 cm by 20 cm (8 in by 8 in) square that can be placed at any location on the floor tile panel. The deflection of a 61 cm (24 in) square floor tile panel should not exceed 0.24 cm (0.1 in) with load applied to the center of the panel edge.
- Pedestal assemblies must be capable of supporting 2268 kg (5000 lb) axial load without deformation. The pedestal must be adhered to the subfloor to resist a side force of 9 kg at 45.7 cm (20 lb at 18 in) or the equivalent of 40.7 Newton-meter (30 ft-lb) applied horizontally without the floor tile panels or stringers installed.
- Stringers in the raised floor system must be capable of supporting a concentrated load of 91 kg (200 lb) at the center of the span with a permanent set not to exceed 0.025 cm (0.1 in).

The floor covering can contribute to a buildup of high static electrical charge. To minimize static charge:

- Provide a conductive path to ground from the metallic raised floor structure through the metallic supporting structure or separately from each tile.
- Make sure the maximum resistance for floor surface material is 20 gigohms, measured between the floor surface and building ground.
- Make sure the resistance between adjacent tiles is not less than 150 kilohms when measured between any points on the floor, spaced 91.5 cm (36 in) apart.
- Maintain antistatic floor covering according to supplier's recommendations.

3.3 Air Cooling

The process cooling needed for computers and electronic equipment differs from the air conditioning used in offices. Comfort air-conditioning systems are designed for the lower heat and higher moisture generated by the human body. In contrast, equipment has high heat output that is moisture-free (sensible heat). In comfort systems, sensible heat normally produces 60 to 70 percent of the load, whereas the dry heat of electronic equipment produces a sensible heat ratio of over 95 percent.

When possible, install separate air systems for each room of the computer installation containing components:

- A controlled-environment room for computers, tape and disk drives, communication processors, and other units requiring a high degree of cleanliness, close control of temperature and humidity, and infrequent access by personnel
- A room for printers and other items of equipment, with additional air filtering to remove chaff, dust, and toner
- A control room for system operations personnel, permanent staff, and the terminals needed to run the system

The control room can be a normal office environment. In the computer equipment room and the printer room, however, process cooling systems should be completely separate from the central building air system and separate from each other.

Storage servers require a controlled environment room with a high degree of cleanliness, close control of temperature and humidity, and infrequent personnel access.

3.4 Air Supply

The process cooling capacity for the computer facility needs to be sufficient to remove the heat generated by the equipment. When conditions in the computer room change (new units are added, the computer system is moved), make temperature checks.

The amount of outside (make-up) air should be kept to the minimum needed to create a slight positive pressure within the room, and should not exceed industry recommendations of 0.3 cubic meter / minute (10 cubic feet / minute) per person stationed in the equipment room. While recommendations for outside air in comfort air-conditioning are 10 to 15 percent of the airflow, the computer room environment is cleaner and operates more efficiently if outside air is kept below 1 percent of the airflow. Cooling, heating, and humidification needs are reduced, and a minimum of contaminated building air is introduced into the computer room.

3.5 Air Cleanliness

Use a high-efficiency air filter on each air inlet for outside air to stop dust at the point of entry to the computer room. Special additional filtering is necessary where the environment is exposed to salt air, corrosive gases, or unusual dust or dirt conditions.

Electronic equipment is sensitive to air contaminants such as:

- Excessive amounts of soot particles
- Condensate particulates such as carbonates
- Concrete particulates from unsealed concrete
- Metal flakes or filings, such as those produced by sawing, filing, or drilling
- Floor-cleaning solutions with high ammonia content
- Deteriorating or decomposing building materials, including floor tiles, fabrics, sheetrock, insulation, and acoustical tiles
- Pollutants generated by any servicing performed in and around the computer room
- Paper chaff, dust, and toners from printers within the computer room
- Processing chemicals from reproduction equipment such as microfiche processors

In electronic equipment, contaminants cause connector contact and motor-bearing degradation. They also cause electrical leakage, shorting paths between integrated circuit leads and between printed wiring traces on printed circuit boards.

Air supplied to and circulated within the computer room must pass through mechanical or electrostatic filters. The following filter efficiency ratings and terms are defined in accordance with the current editions of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, (ASHRAE) publications, *ASHRAE Standard* 52-76 and *ASHRAE Standard* 62.

- Mechanical filters must be rated at a minimum dust spot efficiency of 45 percent
- Electrostatic plate filters must operate at 85 to 90 percent efficiency at the applicable face velocity
- Filters should be inspected and maintained in accordance with the manufacturer's specifications

Air contaminants can cause storage server malfunction and can damage equipment. Take steps to prevent air contaminants, such as metal particles, solvent vapors, corrosive gases, soot, airborne fibers, or salt, from entering or being generated within the computer room environment.

HVAC ducts and plenums and subfloor areas, including cable raceway openings where used, should be kept clean. Remove all unused cables, hardware, and debris from the underfloor area to avoid becoming dust and dirt traps or potential sources of rust.

Maximum concentrations of surface contaminants are:

- Weight of surface contaminants not to exceed 250,000 micrograms per square foot
- Number of metal particles with diameter, length, or width in the range of 1 to 33 mils not to exceed 25 per square foot

Surfaces include:

- Raised floor around the storage server
- Underfloor
  - In the vicinity of the storage server
  - Between the storage server and the HVAC outlets
  - At the HVAC outlets to the underfloor

The customer is encouraged to seek assistance from an independent consultant or a Sun representative if any questions arise.

Maximum concentrations of corrosive gases and solvent vapors must also be considered:

- Use *ASHRAE Standard* 62, "Ventilation for Acceptable Indoor Air Quality." Pertinent guidelines are included in paragraph 6, 6.1, 6.1.1, 6.1.2, and Tables 1 and 2. This standard addresses air contamination concentrations known to impair health or cause discomfort to occupants. The contamination concentration maximums listed in *ASHRAE Standard* 62 Tables 1 and 2 are also adequate guidelines for Sun equipment. Certain contaminants are particularly harmful to computer equipment. These contaminants and their maximum allowable concentrations are extracted from *ASHRAE Standard* 62, Tables 1 and 2, and are listed here in TABLE 3-1.
- Sampling is to be conducted in accordance with National Institute for Occupational Safety and Health (NIOSH) procedures as referenced in *ASHRAE Standard* 62.
- The customer is encouraged to seek assistance from an independent consultant or a Sun representative if any questions arise.
- For the safety and health of people at the site, also refer to applicable national and local safety standards on air contaminants.

TABLE 3-1 Air Contaminants

Contaminant	Maximum Allowable Concentration (micrograms per cubic meter)
Ammonia (NH_3)	500
Nitrogen Dioxide (NO_2)	100
Sulfur Dioxide (SO_2)	80
Chlorine (CL)	100
Hydrogen Sulfide (H_2S)	50
Oxidants (Ozone)	235
Hydrocarbons*	4000

*Hydrocarbons, although not included in *ASHRAE Standard* 62, are harmful to computer equipment.

3.6 Temperature and Relative Humidity

Underfloor air cooling is not supported by the A7000; therefore, above-the-floor air cooling is required and must be maintained within specifications.

The storage server can tolerate temperature and humidity fluctuations if the following guidelines are understood and followed. Exposure to conditions outside the specified ranges may damage the storage server.

Before the storage server is powered on, the air entering the storage server must be clean and within the ranges specified for temperatures and humidity. The room humidity must be kept sufficiently low to prevent condensation on or within the storage server, and must never exceed the limit specified in the storage server environmental requirements tables, including transients.

Caution – The storage server must never be exposed to conditions that could cause internal condensation to occur within the storage server.

When moving the storage server from the equipment moving van to the installation location, the rates of temperature and humidity change must not exceed the values specified by the shipping limits information in Chapter 6.

Do not store the storage server in environments with humidity above 90 percent. Consult a Sun representative for guidelines when storing, packaging, or moving Sun computer equipment. Before accepting delivery of the storage server from the shipping company, thoroughly inspect each crate as it is unloaded, checking for evidence of damage by water, fire, or impact. If any crate has observable damage, consult with Sun before signing for the storage server.

Storage servers shipped or stored at extreme temperatures may require time to adjust to operating temperatures before start-up.

The air-conditioning units should have controls monitoring their output that respond to ±1 degree C (±2 degrees F) and ±5 percent relative humidity.

Humidification is normally required to replace moisture removed during the cooling process. The relative humidity for a storage server equipment room should be set at 40 percent. This level is sufficient to suppress electromagnetic charge buildup, and low enough to avoid the risk of corrosion and condensation. To avoid air contamination from the humidifier, water treatment may be necessary in areas with high mineral content.

3.7 Special Considerations

All specifications defined in this chapter must be maintained for all phases of:

- Equipment addition, removal, or relocation
- Computer room modifications

During major changes in the computer room environment, special considerations must be taken into account whenever any drilling, sawing, welding, brazing, etc., is performed in the computer room. Precautions must be taken to prevent material particles (concrete or metal particles, etc.) from becoming airborne. Storage server equipment should be powered down during construction that requires any drilling, sawing, welding, brazing, and so on. All debris must be removed before powering up the storage server.

CHAPTER 4

Input Electrical Power and Grounding

This chapter defines the StorEdge A7000 storage server electrical environment and general power source requirements. Guidelines are provided for safe and reliable operation. Chapter 6 describes specific storage server specifications.

For further information, consult the *Federal Information Processing Standards Publication* (FIPS 94), the *National Electrical Code* (NFPA 70), and local and national codes.

4.1 Input Power Quality

The input power quality is critical to storage server performance and reliability. Variations in the input power can cause a power failure or malfunction. Causes of transient signals and noise on commercial power lines are difficult to locate or are beyond the user's control. To reduce the impact of the irregularities, power conditioning may be needed.

The storage server should have a separate power feeder for its power cable(s). Customers should consider future growth when planning a storage server installation. Size the power input feeder(s) for the maximum potential storage server configuration.

Note – Both input power cords for the StorEdge A7000 must be wired to the same AC phase. This is required for single power grid, dual power grid, and any alternate power source that may be available. Do not supply power to the A7000 from separate power sources, including backup sources such as house UPS or generators, unless phase synchronization can be guaranteed at all times.

4.2 Storage Server Grounding

An insulated grounding conductor must be installed as part of each branch circuit that supplies the storage server. This conductor must have identical voltage insulation as the grounded and ungrounded branch circuit supply conductors, and it must be color-coded green or green with yellow stripe(s). This conductor must not be a part of any other system ground, and it must be grounded to earth at the service equipment or other acceptable earth ground, such as the building frame in the case of a high-rise, steel-frame structure.

For each power system, the grounding conductor must be routed in the same conduit as its corresponding power conductors. Local codes may determine the manner of connection of ground wiring. The two system branch grounding connectors are identified with the IEC Symbol 5019, a ground symbol within a circle.

Refer to "Customer Ground Point" on page 6-13 in Chapter 6 for specific grounding requirements.

4.3 Electrostatic Discharge

The storage server is susceptible to failure due to electrostatic discharge (ESD). Types of floor covering, room humidity, and other factors contribute to electrostatic buildup and discharge. The storage server can withstand a maximum of 10,000 V ESD when operating in the proper environment with all covers closed.

4.4 50/60 Hz Power Source

The A7000 storage server self-regulating power supplies work with input power frequencies ranging from 47 to 64 Hertz (Hz).

4.4.1 Voltage Tolerance

The Voltage Tolerance for the A7000 storage server is 208/240 volts AC, plus or minus 10%. The self-regulating power supplies automatically adjust for optimum output voltage.

4.4.2 Harmonic Content

The maximum total harmonic content of the power system voltage waveform on the equipment feeder must not exceed 5 percent with the equipment operating.

4.4.3 Voltage Spikes

The storage server can withstand a voltage spike of 100 volts over nominal voltage for 10 microseconds.

4.4.4 Lightning Protection

Installing a lightning protection device on the computer room power source is recommended when the following conditions exist:

- The primary power is supplied by an overhead power service
- The utility company installs lightning protectors on the primary power source
- The area is subject to electrical storms or an equivalent type of power surge

4.4.5 Emergency Power Off

If the costumer requires, the PCU(s) may be configured to provide Emergency Power Off (EPO) to the A7000 and HDSA expansion cabinet.

CHAPTER 5

Sun Remote Support

This chapter describes the StorEdge A7000 diagnostic assistance capabilities and its general requirements and controls.

5.1 Purpose

Sun provides remote support to Sun field engineers who can be connected to Sun by telephone linkup. Telephone connections to Sun can be established when authorized by the customer.

Items for Sun remote support include:

- Federal Communications Commission (FCC) or comparable national requirements
- Customer premises equipment
- Protective circuits
- Modems
- Protective coupler

Part 68 of the FCC's *Rules and Regulations* also affects customer premises equipment (CPE) by requiring equipment such as telephones, modems, and protective couplers attached to public switched-telephone networks to be registered with the FCC.

It also requires that customers provide protective circuits to protect the switched-telephone network from harm. The protective circuit is provided in two forms. Some configurations use an external device called a data-protective coupler. The coupler is a stand-alone unit that is inserted between an unprotected modem and the switched-telephone network interface. Recent modem designs include protective circuits so that external couplers are not required.

5.2 Requirements

Each telephone, modem, and protective coupler used on the public switched-telephone networks must be registered with the FCC. When ordering communications facilities, the customer must specify the receptacles required to terminate the line. The customer must also provide the telephone company with specific registration information for each device to be directly attached to the switched-telephone network.

The FCC requires the following information:

- Device name and model number
- FCC registration number
- Ringer equivalence number (REN)

- Specific connection requirements for the Sun facility vary outside the USA and Canada:
  - Use Postal Telephone and Telegraph (PTT) interface for acoustic couplers (Electronic Industry Association/Consultant Committee of International Telephone and Telegraph V.24/V.28/V.32)
  - Use switched network termination for line plate interface
  - Use PD1-A (network call unit MM 2 couplers) for Japan and Nippon Telephone and Telegraph interface

One telephone line must be provided for modem operation. Sun requests another telephone line for voice communication during Sun support sessions. Both phone lines should be located within 3.1 m (10 ft) of the StorEdge A7000. Both the modem and voice lines should be terminated with an RJ11C or equivalent receptacle. The modem may require a data-quality line.

CHAPTER 6

Specifications

This chapter provides specification information for the StorEdge A7000, optional HDSA expansion cabinet, power conditioning unit (PCU), bypass switches, and ground point. This information includes power requirements, cabinet dimensions and weights, floor layout, and safety requirements. The following topics are covered:

6.1 A7000

TABLE 6-1 lists the specifications for the A7000 storage controller; FIGURE 6-1 shows the A7000 storage controller.

TABLE 6-1 StorEdge A7000 Specifications

		International	Domestic
Physical	Height	200.7 cm	79.0 in
	Width (cabinet)	73.7 cm	29.0 in
	Width (I/O Bay cabinet without doors installed)	30.5 cm	12.5 in

TABLE 6-1 StorEdge A7000 Specifications *(Continued)*

		International	Domestic
	I/O Bay cabinet doors	5.1 cm	2.0 in
	Total width	109.2 cm	43.0 in
	Total width including service clearance	185.4 cm	73.0 in
	Depth (without System Console)	99.1 cm	39.0 in
	Depth of System Console	10.2 cm	4.0 in
	Total depth	109.3 cm	39.0 in
	Total depth including service clearance	312.4 cm	123.0 in
	Weight	659 kg (max)	1450 lbs (max)
	Total floor area required (including all clearance)	6.0 m^2	64.7 ft^2
	Approx. noise level	n/s	n/s
Heat Dissipation (max)		7276 kilogram-calories per hour	28874 BTU per hour
Regulatory	Safety	CSA C22.2 No. 950 EN 60950 CB scheme with Nordic Deviations EMKO-TSE (74-SEC) ZH1/618 IEC 950	UL 1950
	RFI/EMI	ICES-003 Class A VCCI Class A EN55022 Class A	FCC Class A
	Immunity	EN50082-1	
	Harmonics	EN60555-2	
	Laser	IEC 825-1 and 825-2 Class 1 Laser Requirements per CFR 21, Part 1040, UL recognized CSA and TUV recognized	Class 1 Laser Requirements per CFR 21, Part 1040, UL recognized

TABLE 6-1 StorEdge A7000 Specifications *(Continued)*

		International	Domestic
	Compliance	yes	yes
Power cables, each	Length	4.2 m	14 ft
	Number of conductors	3 wire: phase, neutral, ground (earth)	3 wire: X phase, Y phase, ground
	Color of wires	Brown, light blue, green / yellow	Black, white, green
	Wire size (gauge)	6.0 mm^2 @ 85° C	8 AWG (3.26 mm)@ 85° C
	Plug, boot, and seal type	50A 250V Marinco P / N: CS8265N Marinco Boot 7717N Seal 510R	50A 250V Marinco P / N: CS8265N Marinco Boot 7717N Seal 510R
	Cable type	HAR	SO
Temperature	Maximum range	Operating: 10 to 30° C Storage: 10 to 50° C	Operating: 50 to 86° F Storage: 50 to 122° F
	Optimum range	Operating: 18 to 24° C Storage: n / a	Operating: 65 to 75° F Storage: n / a
Relative humidity (noncondensing)	Maximum range	Operating: 40 to 80% Storage: 20 to 90%	Operating: 40 to 80% Storage: 20 to 90%
	Optimum range	Operating: 40 to 60% Storage: n / a	Operating: 40 to 60% Storage: n / a

Legend:

(max) = fully loaded cabinet with two complete disk arrays and two 14-slot nucleus chassis

n / a = not applicable to this configuration

n / s = not specified

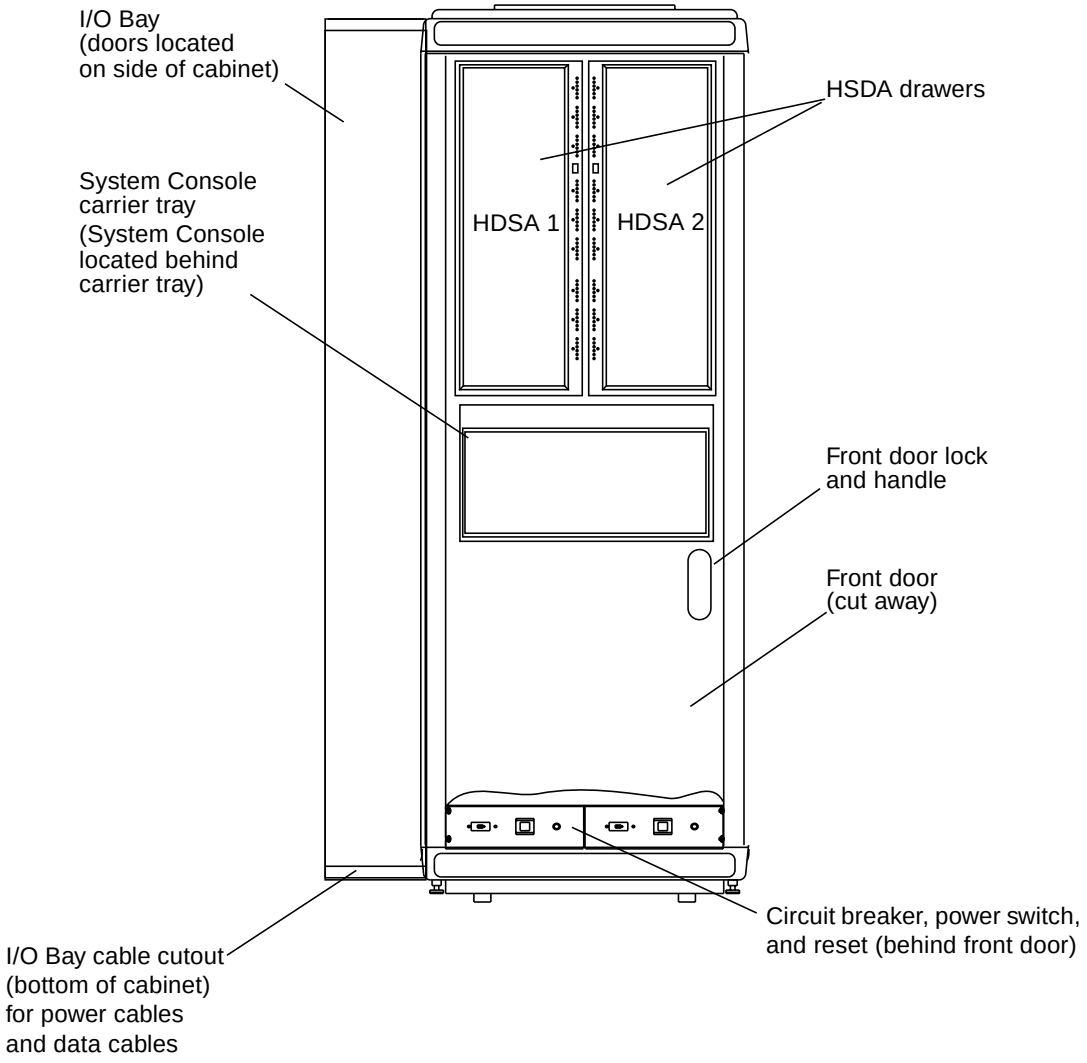


FIGURE 6-1 StorEdge A7000

6.2 HSDA Expansion Cabinet

TABLE 6-2 lists the specifications for the optional HDSA expansion cabinet; FIGURE 6-2 shows the optional HDSA expansion cabinet. When the optional HDSA expansion cabinet is installed, it is bolted to the side of the A7000 cabinet opposite the I/O Bay.

TABLE 6-2 HDSA Expansion Cabinet Specifications

		International	Domestic
Physical	Height	200.7 cm	79.0 in
	Width	73.7 cm	29.0 in
	Depth	99.1 cm	39.0 in
	Total depth, including service clearance	312.4 cm	123.0 in
	Weight	726 kg (max)	1600 lbs (max)
	Total floor area required (including all clearance)	2.3 m^2	24.8 ft^2
	Approx. noise level	n/s	n/s
Heat Dissipation (max)		7276 kilogram-calories per hour	28874 BTU per hour
Regulatory	Safety	CSA C22.2 No. 950 EN 60950 CB scheme with Nordic Deviations EMKO-TSE (74-SEC) ZH1/618 IEC 950 IEC 825-1 and 825-2	UL 1950
	RFI/EMI	ICES-003 Class A VCCI Class A EN55022 Class A	FCC Class A
	Immunity	EN50082-1	
	Harmonics	EN60555-2	
Power cables, each	Length	4.2m	14 ft

TABLE 6-2 HDSA Expansion Cabinet Specifications *(Continued)*

		International	Domestic
	Number of conductors	3 wire: phase, neutral, ground (earth)	3 wire: X phase, Y phase, ground
	Color of wires	Brown, light blue, green / yellow	Black, white, green
	Wire size (gauge)	6.0 mm^2 @ 85° C	8 AWG (3.26 mm) @ 85° C
	Plug, boot, and seal type	50A 250V Marinco P / N: CS8265N Marinco Boot 7717N Seal 510R	50A 250V Marinco P / N: CS8265N Marinco Boot 7717N Seal 510R
	Cable type	HAR	SO
Temperature	Maximum range	Operating: 10 to 30° C Storage: 10 to 50° C	Operating: 50 to 86° F Storage: 50 to 122° F
	Optimum range	Operating: 18 to 24° C Storage: n / a	Operating: 65 to 75° F Storage: n / a
Relative humidity (noncondensing)	Maximum range	Operating: 40 to 80% Storage: 20 to 90%	Operating: 40 to 80% Storage: 20 to 90%
	Optimum range	Operating: 40 to 60% Storage: n / a	Operating: 40 to 60% Storage: n / a

Legend:

(max) = fully loaded cabinet with four complete disk arrays
n / a = not applicable to this configuration
n / s = not specified

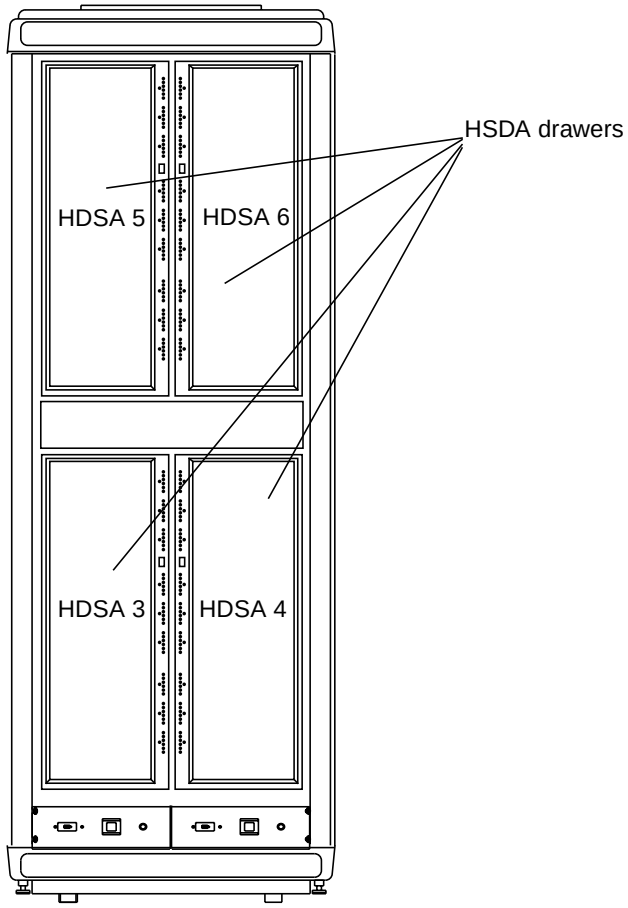


FIGURE 6-2 Optional HDSA Expansion Cabinet

6.3 Power Conditioning Unit (PCU)

TABLE 6-3 lists the specifications for the PCU device; FIGURE 6-3 shows the PCU. Each PCU will be connected to the A7000 or optional HSDA expansion cabinet by a 9.1-meter (30-foot) RS-232 date cable, supplied by Sun.

The PCU is manufactured by Best Power Technologies. More information about its specifications can be found in the *Best Power Technology UNITY/I Installation Manual*, shipped with the PCU.

TABLE 6-3 PCU Specifications

Model Number	UT8K
Capacity	8 KVA / 8 KW
AC Input Voltage (Nominal)[1, 2]	208
AC Input Current (Amperes)[3] 208 V Input	43
AC Input Frequency[4]	50 / 60 Hz ± 3 Hz
AC Output Voltages[2]	230 VAC ±5% @ 50 A twist-lock receptacle
Efficiency on AC Line[5]	96
Maximum Heat Output (on AC Line)	1500 BTU / hour 0.440 KW / hour
Audible Noise (dBA) (on AC Line at 1 meter)	40
Typical Runtime (minutes)	
Full Load	11
75% Load	17
50% Load	27
Weight (with Batteries)	222 kg / 490 lbs
Height	80 cm (31.5 in), plus 10.2 cm (4 in) clearance at top for ventilation
Width	32.4 cm (12.75 in), plus 91 cm (36 in) on each side service clearance (recommended by manufacturer)
Depth	83.6 cm (32.5 in), plus 10.2 cm (4 in) clearance for ventilation at rear and 91 cm (36 in) clearance for service at front
Ventilation	Air around the PCU must be free of dust, chemicals, or other materials that corrode or contaminate. Air must be free to move around the PCU. Do not place the PCU in a sealed room or container.
Operating Environment[6]	0° to $+40^{\circ}$ C ($+32^{\circ}$ to $+104^{\circ}$ F). 0 - 95% relative humidity (noncondensing).
High Altitude Operation	The maximum operating ambient temperature drops 1° C per 305 m (2° F per 1000 ft) above sea level, with the maximum operating elevation being 3050 m (10000 ft).

TABLE 6-3 PCU Specifications *(Continued)*

Storage Temperature	Batteries: -20° to +40° C (-4° to +104° F) PCU without batteries: -20° to +60° C (-4° to +140° F)

Notes:

1. The unit will operate on AC line at input voltages of 200 V to 254 V.
2. If the nominal AC Input Voltage at the customer site is not 200 VAC and / or the AC Output Voltage from the PCU is not 240 VAC, then the PCU device must be recalibrated. Refer to the *StorEdge A7000 Installation Guide* or *Best Power Technology UNITY/I Installation Manual* for proper procedures.
3. For models with a standard battery charger.
4. Programmable range is 45 to 65 Hz.
5. At 75% resistive load, batteries at full charge.
6. Battery service is longer if the operating temperature stays below 25° C (77° F).

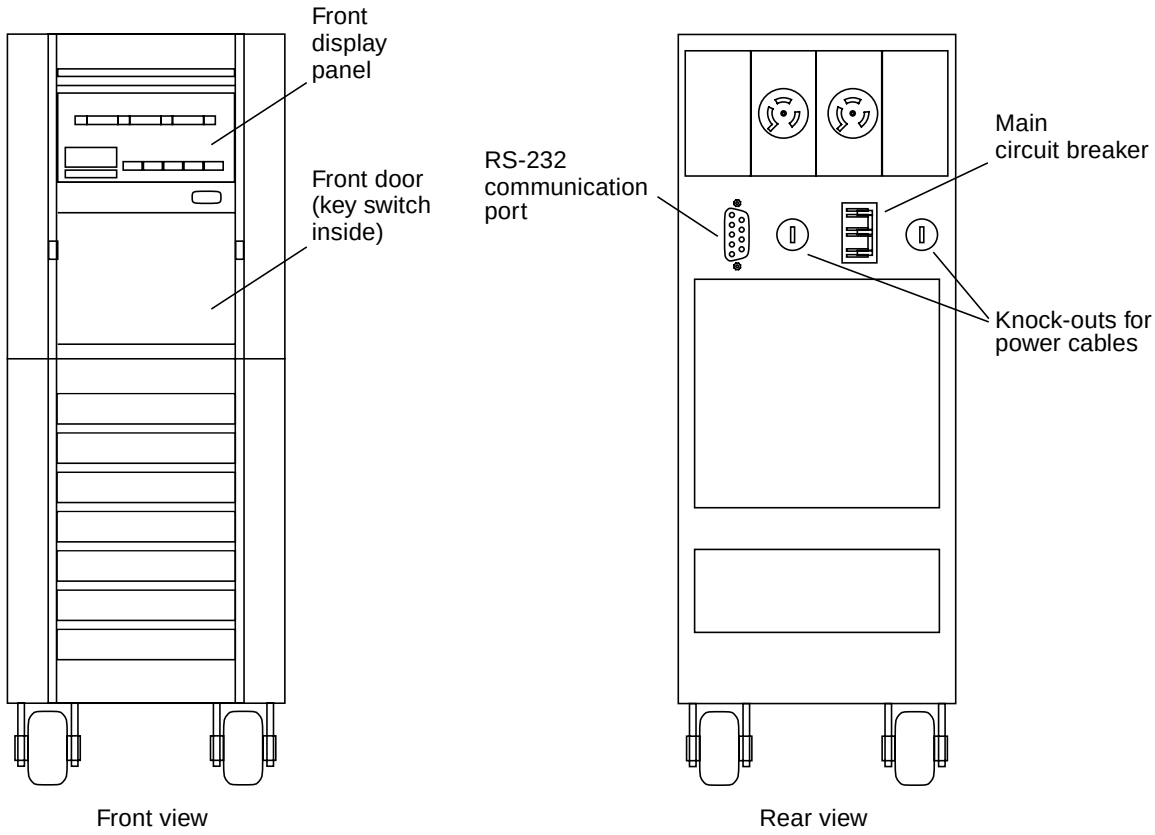


FIGURE 6-3 UT8K Power Conditioning Unit (PCU)

6.3.1 National Electrical Code (NEC) for the PCU

To satisfy National Electrical Code (NEC), the PCU must meet the following requirements:

- An AC disconnect, such as a bypass switch, must be in sight of the PCU to which it is connected. For example, a violation would occur where the bypass switch was in the next room and not visible when the door between rooms is closed.
- The power source to the PCU must run through a 2-pole 60 ampere circuit breaker.

Minimum wire size of 8 gauge is recommended for power to the PCU.

6.4 Bypass Switch

The bypass switch allows the A7000 to be powered directly from the site's AC line, bypassing the PCU. This allows the A7000 to continue functioning while the PCU is offline. The PCU must be hardwired to a bypass switch by a licensed electrician.

The bypass switch is not delivered with the A7000 and PCU. It switch should be ordered from the manufacturer, Best Power Technologies, prior to the installation

Three types of bypass switches are available, as described in the following sections:

- Make-before-break (MBB) with isolation transformer, for domestic power use—page 6-12
- Break-before-make (BBM) without isolation transformer, for domestic power use—page 6-12
- Make-before-break (MBB) without isolation transformer, for international power use—page 6-12

In domestic environments, the type of bypass switch installation determines whether the PCU can be removed without power interruption. In the BBM installation type, for example, the bypass switch breaks the existing power connection before making the new one.

In international environments, the bypass switch operates without power interruption.

All three types of bypass switches have the same external appearance and the same specifications, as described in and shown in.

TABLE 6-4 Bypass Switch Specifications

Model Number	BPE-04
Rating, Continuous	80A / 300V
Rating, Maximum	100A / 300V
Frequency	50 / 60 Hz
Weight	13.6 kg (30 lbs)
Height	45.7 cm (18 in), plus 91 cm (36 in) clearance each at top and bottom for service
Width	40.6 cm (16 in), plus 91 cm (36 in) on each side service clearance (recommended by manufacturer)
Depth	22.9 cm (9 in), plus 91 cm (36 in) clearance at front for service

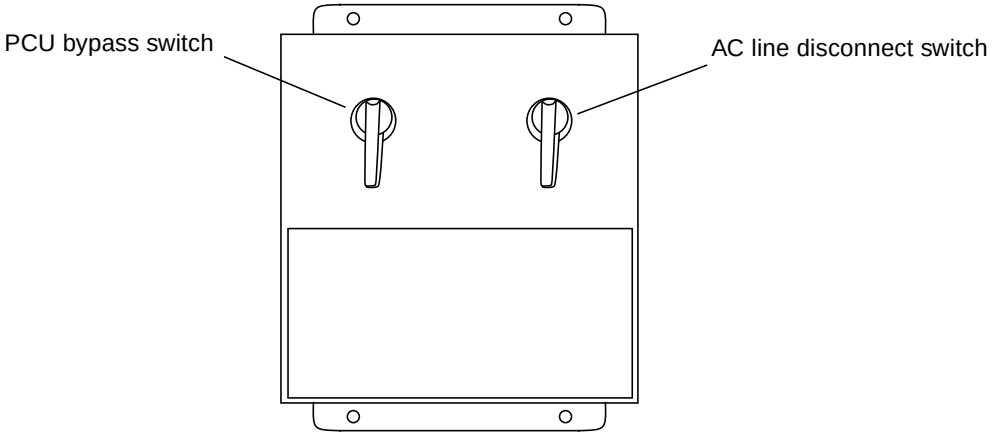


FIGURE 6-4 Best Power Technologies Bypass Switch

Note – The bypass switches must be mounted in a location where it will be within sight of the PCU at all times.

More information about the bypass switch, including instructions on wiring it to the PCU, is included in the *Best Power Technology UNITY/I Installation Manual*, shipped with the PCU.

6.4.1 Make-Before-Break With Isolation Transformer

In domestic power environments, the MBB installation lets you use the bypass switch without interrupting power to the A7000. This type of installation requires an isolation transformer, which is used to convert typical three-phase 208 VAC to single-phase (220 to 240) VAC for input to the PCU (a single-phase product). The transformer is important because during this type of bypass operation, the input and output of the PCU are momentarily connected.

For this type of installation, use the Best Power Technologies Model BPE-04-MBB-1A bypass switch with the Best Power Technologies Model TRN 1195 isolation transformer (Sun part number 150-3078).

6.4.2 Break-Before-Make Without Isolation Transformer

BBM installations are used in domestic power environments and without an isolation transformer. In these types of installations, the A7000 must be powered off during the bypass operation because power is lost momentarily during the procedure. The A7000 can be directly connected to three-phase 208 VAC because the A7000 can operate on 200 to 250 VAC 50 Hz/60 Hz line-to-line power.

For this type of installation, use the Best Power Technologies Model BPE-04-BBM-1A bypass switch.

6.4.3 Make-Before-Break Without Isolation Transformer

In international power environments, the MBB installation lets you use the bypass switch without interrupting power to the A7000. This type of installation does not require an isolation transformer; however, the PCU output voltage must be calibrated to the input voltage within +/- 1%.

For this type of installation, use the Best Power Technologies Model BPE-04-MBB-1A bypass switch.

6.5 Customer Ground Point

The A7000, PCU(s), and optional HDSA expansion cabinet must be grounded to a common ground point established at the customer site. The customer common ground point is typically the raised-floor tile metal support post of a ground raised floor system. The customer common ground point must meet the following requirements:

- The resistance between the customer common ground point and an established earth ground reference point must be no more that 0.1 ohms, as measured with a Digital Voltmeter (DVM).
- The customer common ground point must be within 1.83 meters (6 feet) of the items to be grounded (that is, A7000, PCU(s), and optional HDSA expansion cabinet), because this is the length of the Sun ground straps shipped with the A7000. If the ground point cannot be located with 1.83 meters of the items to be grounded, longer ground cables must be used. These ground cables must be the same gauge size or larger than the AC power input cable of the item being grounded.

CHAPTER 7

Layout, Wiring, and Electrical Pre-Installation

This chapter explains how to plan the physical layout of the installation, plan for the wiring requirements, and perform the electrical pre-installation.

Note – The figures in this chapter are not drawn to scale.

7.1 Physical Layout

This section provides detailed space requirement for the StorEdge A7000, HSDA expansion cabinet, PCU, and bypass switch. Use it in conjunction with the templates provided in Appendix B to plan the layout of the installation.

After the physical layout has been planned, refer to “Wiring and Electrical Items” on page Default ¶ Font> to determine the wiring requirements for the installation.

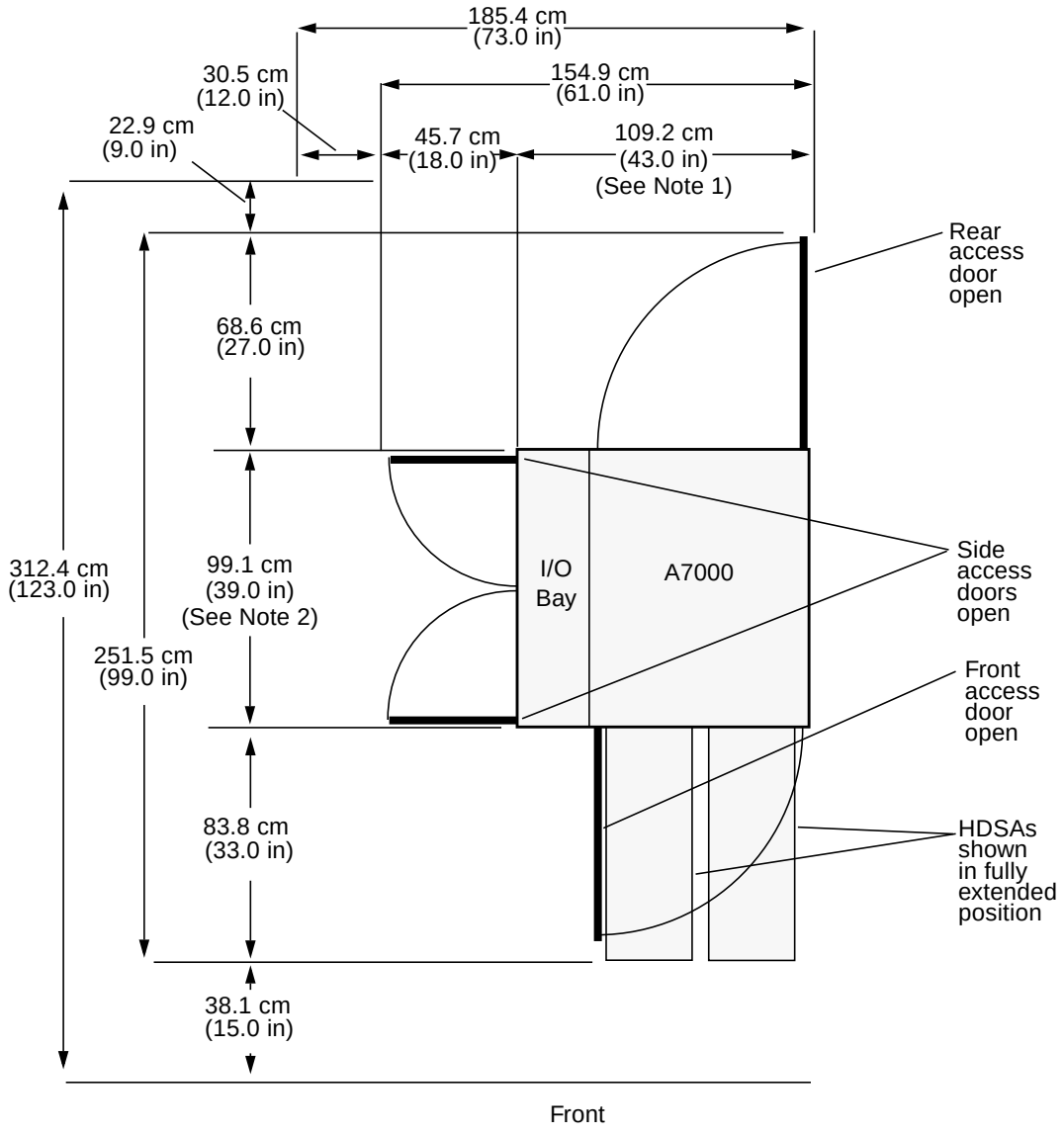
When planning the layout, consider the follow space requirement imposed by electrical needs:

- The distance between the bypass and the PCU is limited to 3 meters if unprotected cords are used. Local codes usually allow this distance to be increased by use of conduit.
- The distance between the bypass and the junction box distance is only limited by electrical codes. This wiring typically requires a conduit.

- The distance between service panel and bypass is site-dependent. This wiring typically requires conduit.

TABLE 7-1 Space Requirements

Item	Height	Width	Depth
A7000	200.7 cm (79 in)	109.2 cm (43 in)	99.1 cm (39 in)
Including Clearance for Cabinet Doors and HSDA Drawers	200.7 cm (79 in)	154.9 cm (61 in)	251.5 cm (99 in)
Including Service Clearance	200.7 cm (79 in)	185.4 cm (73 in)	312.4 cm (123 in)
A7000 with HSDA Expansion Cabinet	200.7 cm (79 in)	182.9 cm (72 in)	99.1 cm (39 in)
Including Clearance for Cabinet Doors and HSDA Drawers	200.7 cm (79 in)	228.7 cm (90 in)	251.5 cm (99 in)
Including Service Clearance	200.7 cm (79 in)	259.1 cm (102 in)	312.4 cm (123 in)
PCU	80.0 cm (31.5 in)	32.4 cm (12.75 in)	82.6 cm (32.5 in)
Including Minimum Required Service and Ventilation Clearance	90.2 cm (35.5 in)	32.4 cm (12.75 in)	183.8 cm (72.5 in)
Including Recommended Service Clearance	90.4 cm (35.5 in)	214.4 cm (84.75 in)	183.8 cm (72.5 in)
Bypass Switch	45.7 cm (18 in)	40.6 cm (16 in)	22.9 cm (9 in)
Including Service Clearance	236.7 cm (90 in)	222.6 cm (88 in)	93.9 (45 in)

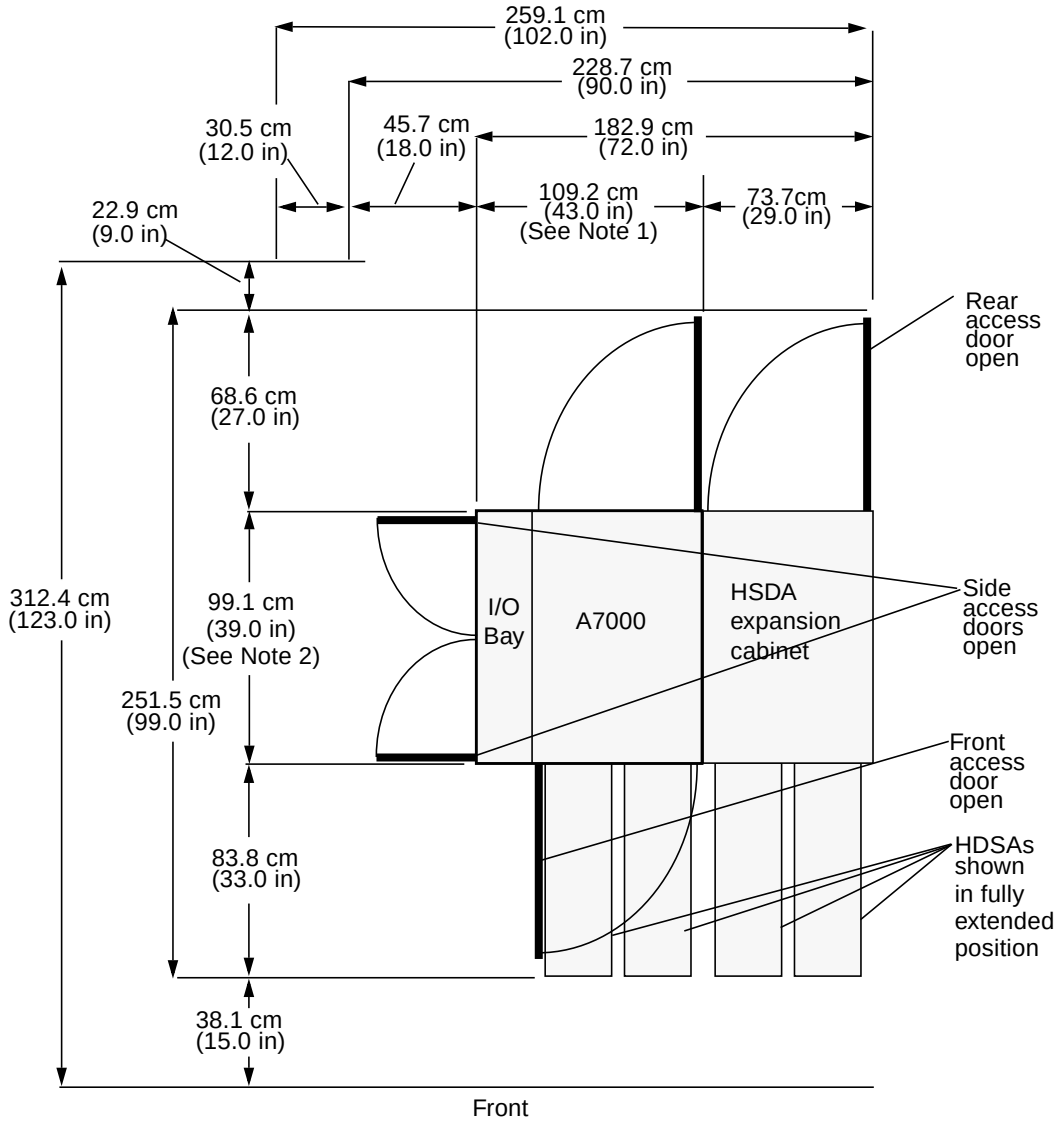


Notes:

1. Subtract 5.1 cm (2.0 in.) if I/O Bay doors are not installed.

2. Add 10.2 cm (4.0 in.) if console tray is open.

FIGURE 7-1 StorEdge A7000 Cabinet With Dimensions, Top View



Notes:

1. Subtract 5.1 cm (2.0 in.) if I/O Bay doors are not installed.

2. Add 10.2 cm (4.0 in.) if console tray is open.

FIGURE 7-2 StorEdge A7000 and Optional HDSA Expansion Cabinet With Dimensions, Top View

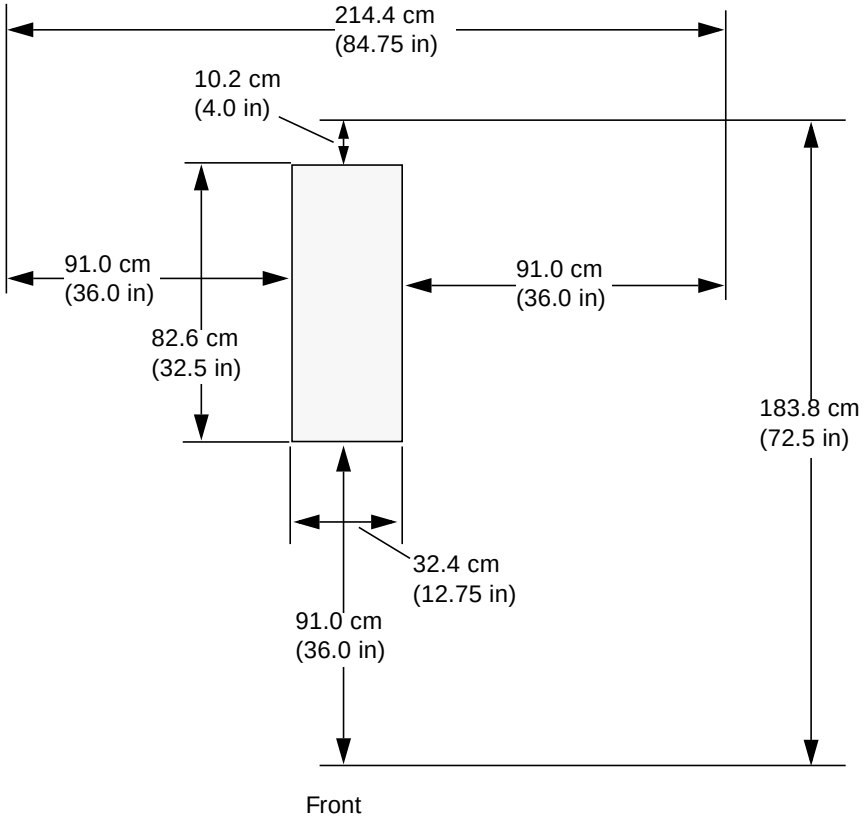


FIGURE 7-3 PCU With Dimensions, Top View

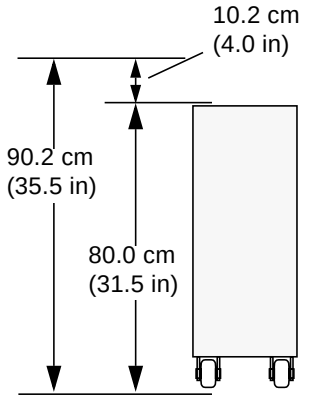


FIGURE 7-4 PCU With Dimensions, Front View

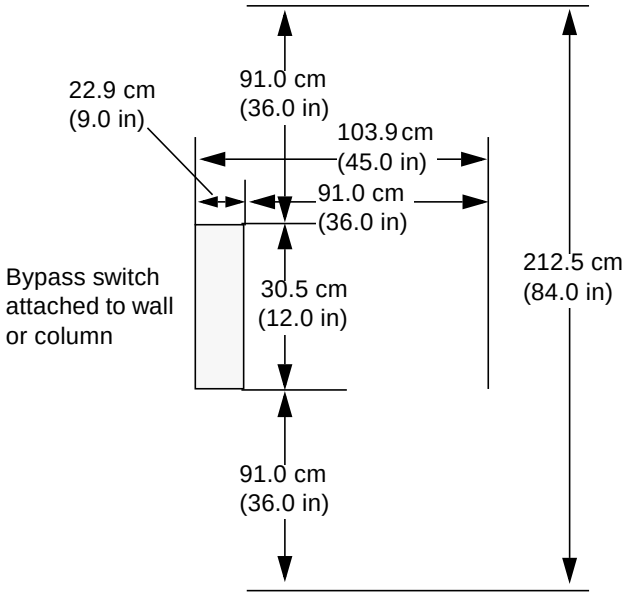


FIGURE 7-5 Bypass Switch With Dimensions, Top View

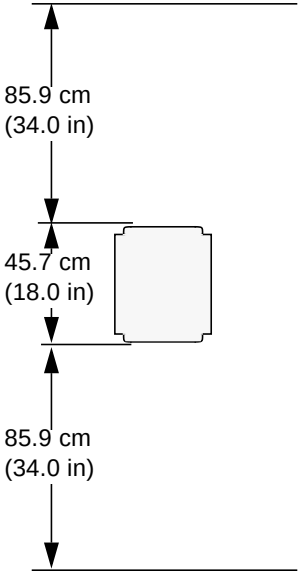


FIGURE 7-6 Bypass Switch With Dimensions, Front View

7.2 Wiring and Electrical Items

After the layout for the installation as been planned, wiring requirements can be determined.Use the layout plan to determined what lengths of wires are required. Remember to include the vertical distance each wire must span when estimating length.

A licensed electrician must determine what types of wire to used based on length, required voltage capacity, and other conditions.

The following items must be ordered from their manufacturers as early in the physical planning process as possible, due to the long lead time required for their delivery:

- One bypass switch per PCU, typically Best Power Technologies Model BPE04-BBM-1A. Refer to ”Bypass Switch” on page 6-10 of Chapter 6 for alternate bypass switch models.
- Two female receptacles per bypass switch, Marinco Specialty Wiring Devices part number CS8269 or equivalent (50A, 250V, 2-pole, 3-wire) receptacles.

In addition, the following standard electrical items must be available at the time of the electrical pre-installation:

- One 60A, 208V, 2-pole circuit breaker per PCU, to be installed in the building circuit panel.
- One junction box in which to mount each pair of Marinco CS8269 (or equivalent) receptacles.
- External PCU output fuse or circuit breaker and box.
- Appropriate conduits, collars, and adaptors.
- Mounting hardware for the bypass switch(es).
- Any additional equipment required to meet local codes and the specific requirements of the installation site, as determined by a licensed electron.

FIGURE 7-7 shows a typical electrical installation. If an HSDA expansion cabinet were part of the installation, it would have its own bypass switch, PCU and junction box containing a pair of Marinco CS8269 receptacles.

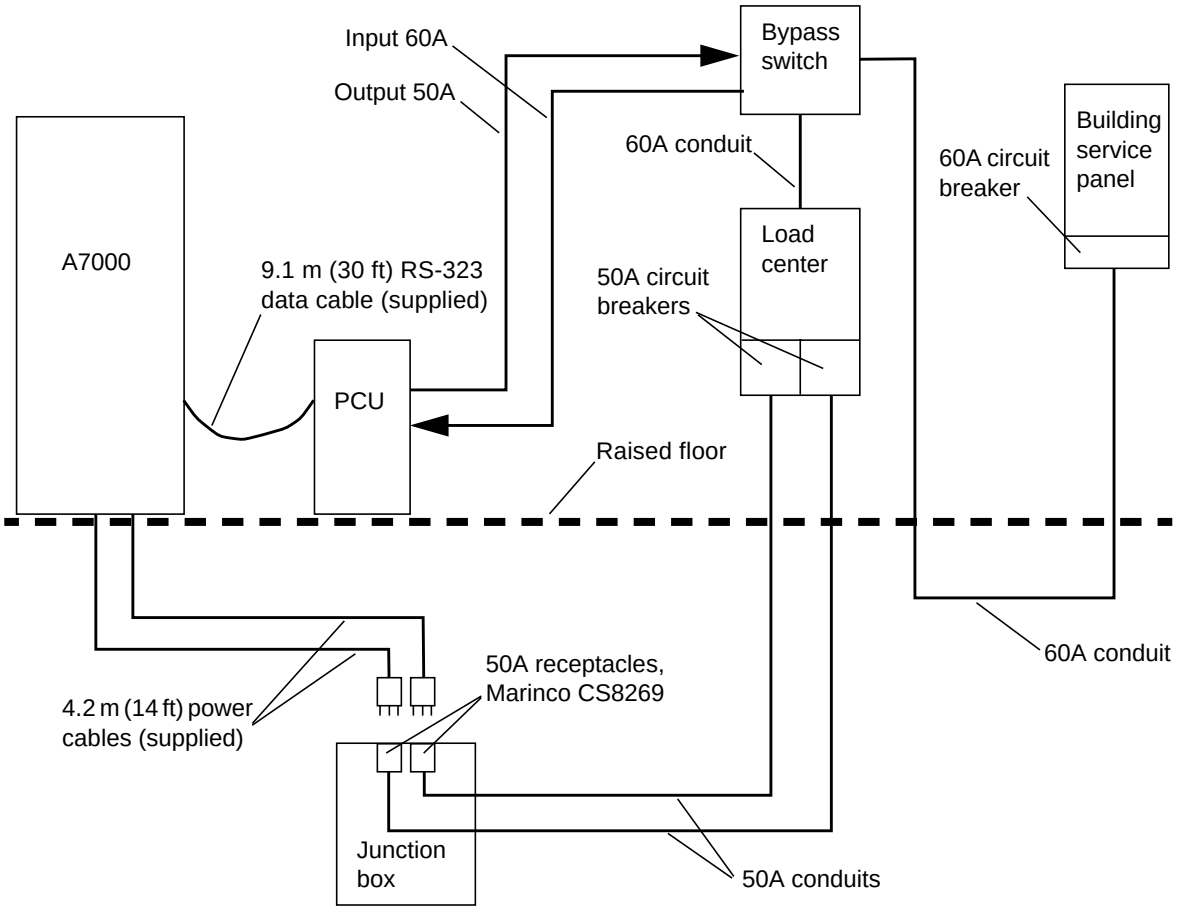


FIGURE 7-7 Typical Electrical Installation

7.3 Electrical Pre-Installation

A few days before delivery of the A7000 or concurrent with the A7000 installation, a licensed electrician must perform the electrical pre-installation:

- Install bypass switch(es) and connect it to the building service panel.
- Connect a load center(s) to the bypass switch(es).
- Install the Marinco CS8269 receptacles for the AC power plugs in junction box(es) and connect them to the load center(s). If two pairs of receptacles or required, install each pair in its own junction box.

For instructions on wiring the bypass switch, the electrician should refer to the wiring diagram printed insight the cover or the bypass switch.

The electrician must follow these guidelines when performing the electrical installation:

- Do not alter length of A7000 line cords or change attached connector.
- At no time are *unsynchronized* (out-of-phase) AC sources allowed to be applied to the A7000 (dual power cords).

APPENDIX **A**

Conversion Information

To use conversion TABLE A-1, find the original unit in the first column, and the new unit in the second column; then multiply the number in the third column by the original value. TABLE A-2 provides a quick reference of fractional decimal-equivalent conversions.

TABLE A-1 Units-of-Measure Conversion

To Convert	Into	Multiply By
Btu / hr	kcal / hr	0.252
tons	Btu / hr	12,000
kW	Btu / hr	3412.1
Btu / hr	hp	3.929×10^{-4}
m^3 / min	ft^3 / min	35.3144
m^2	ft^2	10.7639
m	ft	3.2808
cm	in	0.3937
kg	lb	2.2046
kg / m^2	lb / ft^2	0.2048

TABLE A-2 Fractions to Decimal-Equivalent Conversion

Fraction	Decimal Equivalent
1 / 16	0.0625
1 / 8	0.1250
3 / 16	0.1875
1 / 4	0.2500
5 / 16	0.3125
3 / 8	0.3750
7 / 16	0.4375
1 / 2	0.5000
9 / 16	0.5625
5 / 8	0.6250
11 / 16	0.6875
3 / 4	0.7500
13 / 16	0.8125
7 / 8	0.8750
15 / 16	0.9375

APPENDIX **B**

Scaled Planning Templates

This appendix contains a template to help a customer with installation planning and site preparation. The 1:50 centimeter-scaled templates are for use in countries following the metric measurement system. The 1:48 inch-scaled templates are for use in the United States of America, Canada, and other countries that follow the English measurement system.

B.1 Scaled Templates

FIGURE B-1 to FIGURE B-4 show the scaled planning templates. The scaled figures represent the footprints of an A7000, and A7000 with an HDSA expansion cabinet, a PCU, and a bypass switch. The footprints are presented as a set; the 1:50 scale templates are presented first and the 1:48 scale templates follow.

Use the scaled layout grids when a site facilities layout drawing is not available or is drawn to a scale other than 1:50 or 1:48.

B.2 How to Use the Templates

The customer facilities engineer, aided by the Sun representative, uses the templates to layout a server installation on a customer-provided computer room scaled layout diagram. This diagram typically shows the computer room barriers such as air conditioning units, vertical support beams, power distribution panels, currently installed equipment, and other fixed obstructions. The templates are scaled equipment outlines, with service clearances indicated as dashed or dotted lines. The scales in common use are:

- 1:50 That is, one unit (1 cm) equals 50 units (50 cm).
- 1:48 That is, one unit (1 in.) equals 48 units (48 in.).

A legend indicates and defines required power access and interface cable openings.

To use the templates, the customer's scaled layout diagram must be the same reduction scale as these templates. Otherwise, the templates will only approximate equipment size. Planners must select the required number of template cutouts and maneuver them around the computer room layout until efficient floor space utility is achieved.

The planner must orient the unit outline along the same axis as the floor tiles. The final placement is determined by the actual floor tile cutouts specified in the associated equipment chapters of this manual. Use the template aligning registration points on the template to locate intersecting floor tile corners.

Once the optimum placement has been determined, tape the cutouts into place on the customer's scaled layout drawing. The facilities engineer then makes multiple copies of the final layout and proceeds to mark up the copies for various installation planning requirements such as input power, air conditioning, and interface cable routing.

B.2.1 Notations

The symbols in the template legend denote the entry points and access areas for signal and power cables and service clearances. TABLE B-1 describes the symbols.

TABLE B-1 Template Notation

Symbol	Description
	A square with diagonal lines indicates a cable entry point for cables such as signal interface cables.
	A small circle with a cross indicates the cable entry point for input power cables. This symbol denotes 50/60 Hz power.
	A dashed line encloses the minimum required service clearance area.
	A dotted line encloses the recommended service clearance area.
	A small open circle indicates the equipment caster.
	A small filled-in circle indicates the equipment leveling pad.

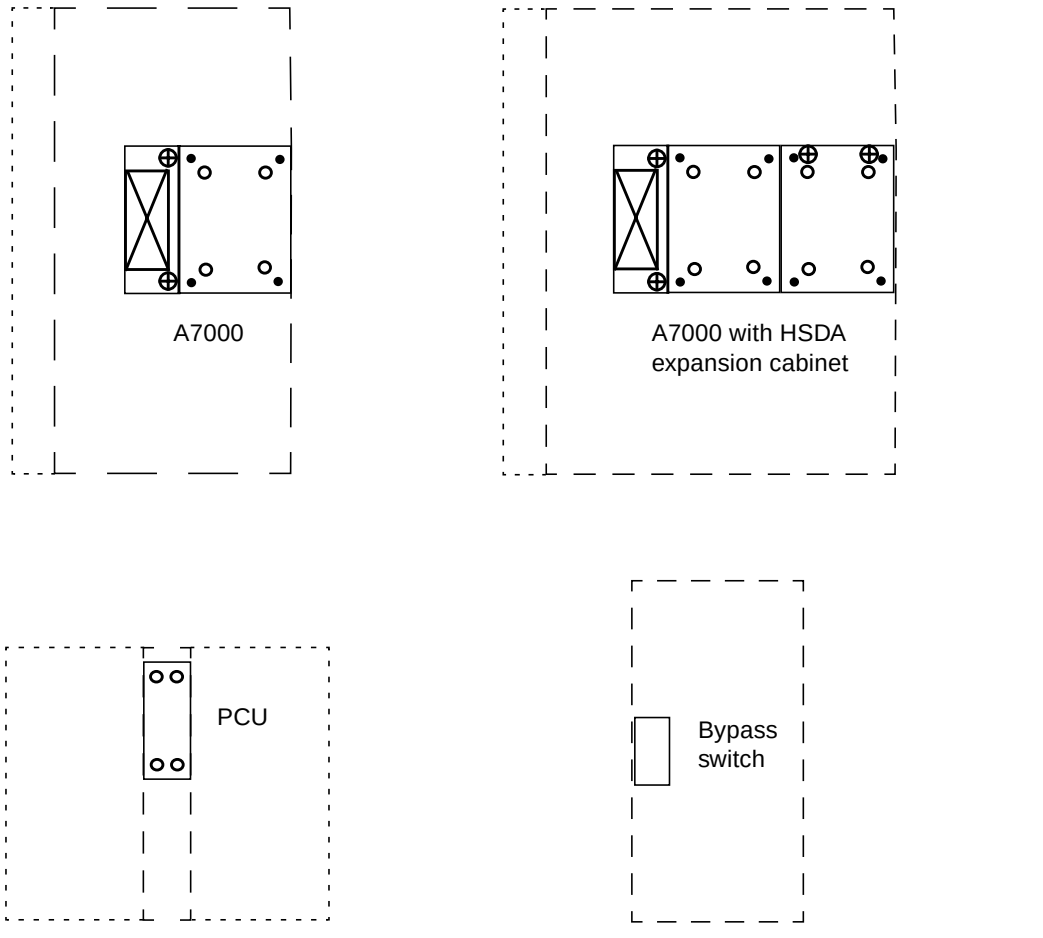


FIGURE B-1 StorEdge A7000 Installation Template (Scale 1:50)

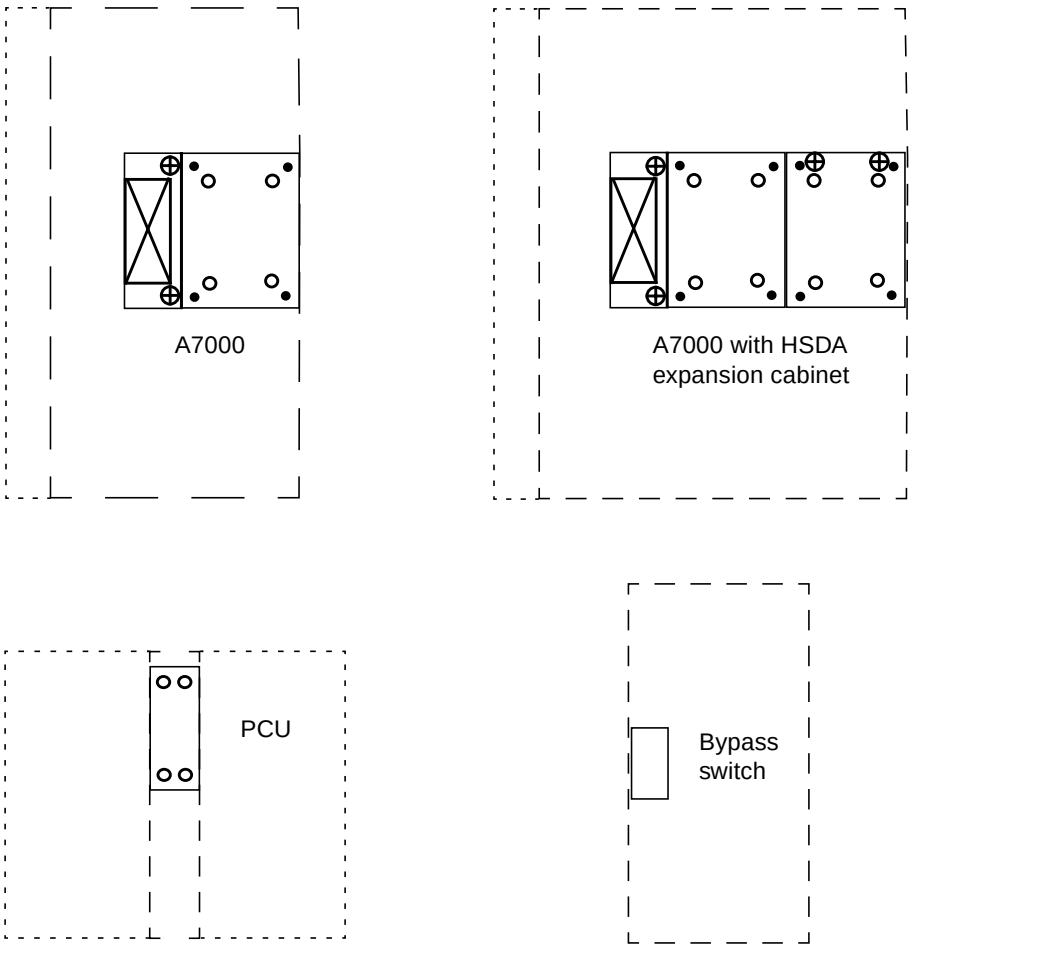


FIGURE B-2 StorEdge A7000 Installation Template (Scale 1:48)

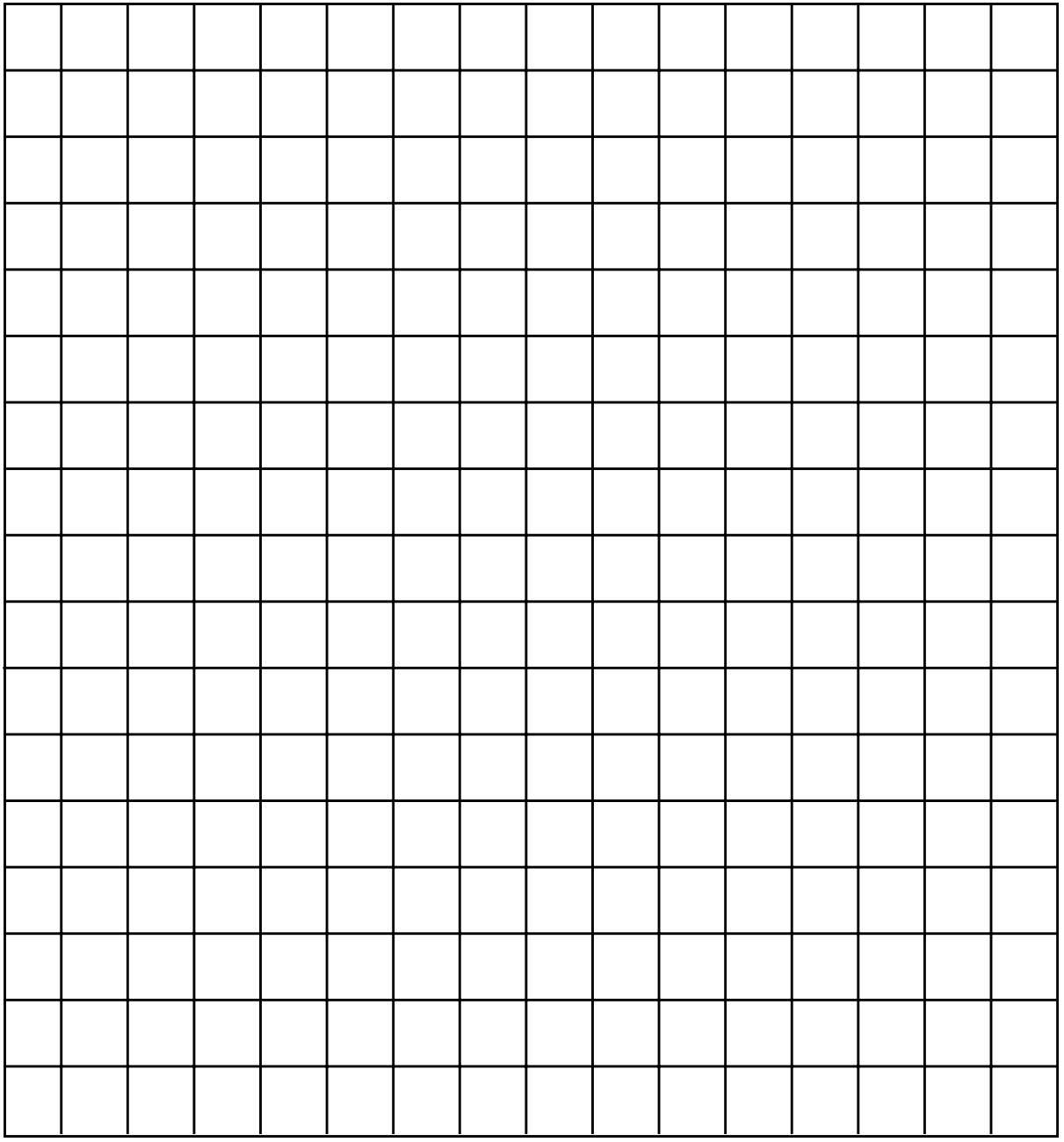


FIGURE B-3 Layout Grid, Scale 1:50

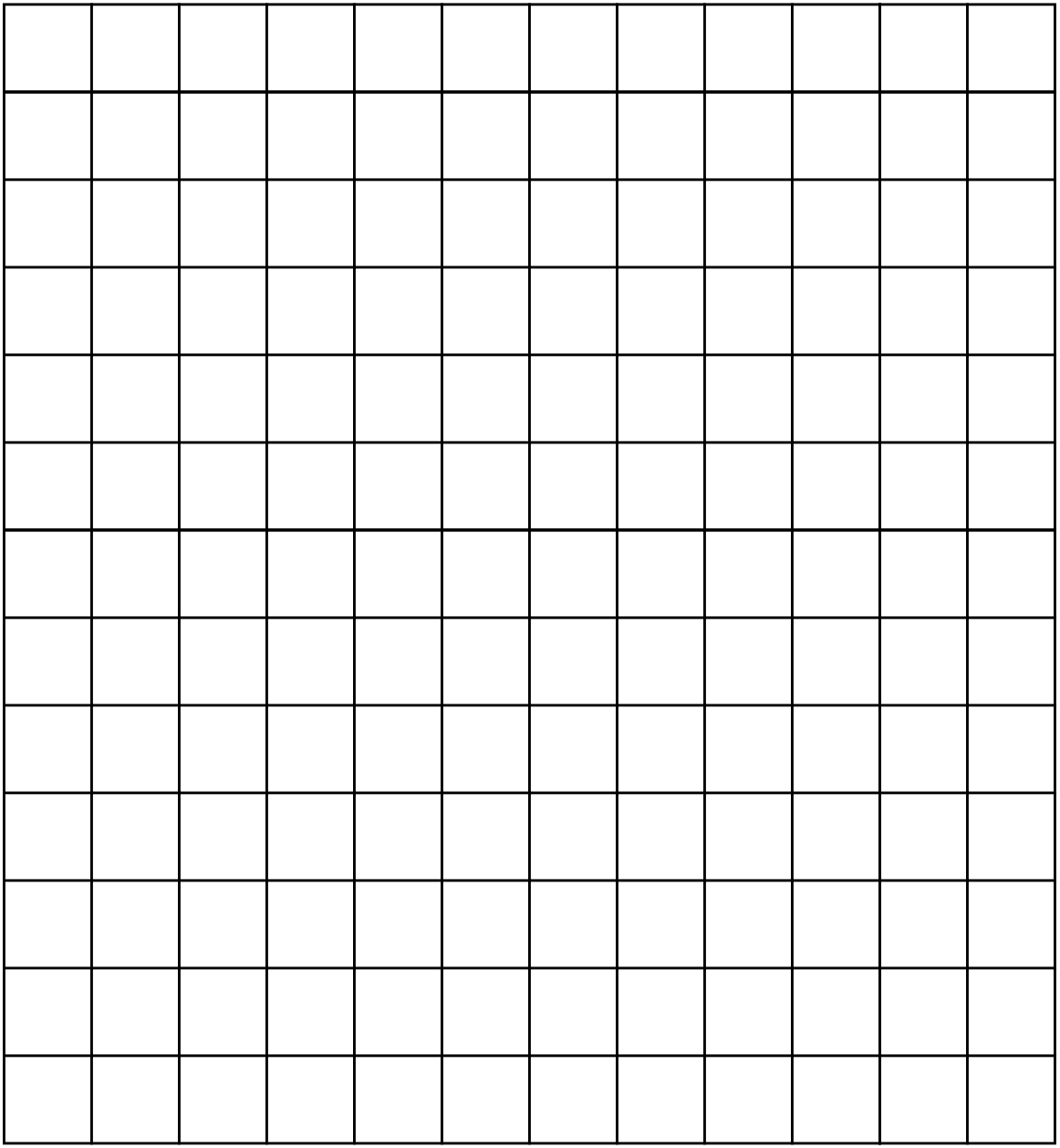


FIGURE B-4 Layout Grid, Scale 1:48

APPENDIX **C**

Pre-installation / Physical Planning Checklist

The SSE completes the Pre-installation / Physical Planning Checklist and forwards it to the sales desk as part of the sales and planning process.

This appendix includes an example of what the checklist typically looks like. A version on the Web supersedes the copy in this manual. You can find the latest version of the checklist at:

`http://sunservice.corp/HASR/OSP/p1/mission-critl/site_planning.current.html`

Site Planning Checklist for A7000

(Rev. 9/9/99)

INSTRUCTIONS:

NOTE: MAKE CERTAIN THIS IS A CURRENT CHECKLIST! THE DATE ABOVE SHOULD BE LESS THAN A MONTH OLD.

1. Mail this checklist to yourself.

   Open the Netscape mailbox. Highlight the entire checklist and copy it (Alt C). Paste the checklist into the mailbox composer window and mail it to yourself.

   Note: If you use the Send Page feature, you will receive the checklist in html format.

2. Open the checklist in your mailbox and fill in the form.

3. Use this checklist to evaluate the supportability of the installation.

4. After you have evaluated the quote for supportability, forward this checklist by e-mail to:

   7k_sales_desk@West.sun.com
   7k_service_desk@spi.central.Sun.COM
   a7k_cfg@east

For additional information or help in completing this checklist, contact a7k_cfg@east.

Use this document to describe the site preparation which MUST be planned or checked BEFORE the installation of an A7000.

When filling out this checklist, refer to the Sun Storage A7000 Physical Manual, doc. number 805-4878-10, at url:

http://edist.corp/smcc/doc/805/index-4.html

Site Name:
Sales Order Number:
Date:

Site Address:
Customer Representative:
        Title:
        Phone:
        e-mail address:
Customer Representative:
        Title:
        Phone:
        e-mail address:
Computer Systems Sales Representative:
        Phone:
        e-mail address:
Enterprise Services Sales Representative:
        Phone:
        e-mail address:
Enterprise Services Service Account Manager (SAM):
        Phone:
        e-mail address:
SSE:
        Phone:
        e-mail address:

A) PHYSICAL REQUIREMENTS:
---

1. Delivery contact name: _____ Telephone #: _____

2. Does the customer require pre-alert before delivery:

   [ ] yes [ ] no [ ] not complete (describe in Section H)

   If so, how much time is required: _____

3. What are the customer's receiving hours: _____

4. Does the customer have a loading dock?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

   If yes, is the loading dock available, accessible by tractor-trailer?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

   If no, does the system have to go through the customer's front lobby?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

5. Is a pallet jack required?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

6. Is a truck with a lift gate required?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

7. Does the system have to be unpacked outside?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

   Is the outside area uncovered?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

8. Are there any special flooring requirements?

   [ ] yes [ ] no [ ] not complete (describe in Section H)

9. Is any additional information required to allow for an "inside delivery?"

   [ ] yes [ ] no [ ] not complete (describe in Section H)

   If yes, please detail: _____

10. Have the doorway and elevator clearances been checked along install route; are ramps provided to raised floor (NO steps should exist along route)?

    [ ] yes [ ] no [ ] not complete (describe in Section H)

11. Has the equipment location/arrangement been planned and diagrammed (locate power source, PCU, A7000, phones, STE, Mainframe, cable route)?

    [ ] yes [ ] no [ ] not complete (describe in Section H)

12. Is service clearance and traffic flow clearance provided; adequate ceiling height (also note sprinkler head clearances)?

    [ ] yes [ ] no [ ] not complete (describe in Section H)

13. Has the flooring tile cut-out arrangement been made?

    [ ] yes [ ] no [ ] not complete (describe in Section H)

14. Are the appropriate number of channel cables on order?

    [ ] yes [ ] no [ ] not complete (describe in Section H)

15. Channel cables: qty: ____ length (in meters): _____ std/ESCON? _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

16. Is spares storage space available (if on-site spares ordered)?

[ ] yes [ ] no [ ] not complete (describe in Section H)

NOTE: The A7000 installation site MUST be capable of supporting the appropriate system weights:

* One base system (A7000):	1450 lbs / 659 kg
* One base system plus expansion cabinet:	2750 lbs / 1250 kg
* One PCU	490 lbs / 233 kg
* One 6-pack with 6 disk drives:	23 lbs / 10.5 kg

B) OPEN SYSTEM REQUIREMENTS:
---

17. STE host system make/model number? _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

18. Is the dedicated SCSI controller on order?

[ ] yes [ ] no [ ] not complete (describe in Section H)

19. SCSI host controller make/model number? _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

20. Is/are the SCSI Target (STE) cable(s) on order?

[ ] yes [ ] no [ ] not complete (describe in Section H)

21. STE cable requirements: qty ____ length _____ connector type _____
(connector type includes: MD68, MC 60, MC68, MD50, C50, D50; male/female)
State which connector type and sex should be on the CABLE:

[ ] yes [ ] no [ ] not complete (describe in Section H)

22. Is an ethernet transceiver (or other adapters) required?

[ ] yes [ ] no [ ] not complete (describe in Section H)

C) ELECTRICAL REQUIREMENTS:
---

23. Is a dedicated primary computer power source available? EMI/RFI controlled? Surge/lightning protected? Properly grounded?

[ ] yes [ ] no [ ] not complete (describe in Section H)

24. Site power utility source identified as [ ] 60Hz [ ] 50Hz

[ ] overhead electrical service [ ] underground electrical service

[ ] yes [ ] no [ ] not complete (describe in Section H)

25. Has the customer been provided with ALL electrical requirements? (e.g. dedicated 2-pole breaker, 208VAC, 60A service per each PCU, etc.)

[ ] yes [ ] no [ ] not complete (describe in Section H)

26. Has an appropriate A7000/PCU ground point been identified?

[ ] yes [ ] no [ ] not complete (describe in Section H)

27. Have all long-lead electrical items not supplied with an A7000 been ordered? (Bypass Switch, receptacles, circuit breakers, transfer switch, etc.)

[ ] yes [ ] no [ ] not complete (describe in Section H)

28. Has a mounting location for the bypass switch been surveyed? (Note: locate within sight of A7000 per National Electric Code)

[ ] yes [ ] no [ ] not complete (describe in Section H)

29. Power source backed by [ ] house-UPS? [ ] generator?

[ ] yes [ ] no [ ] not complete (describe in Section H)

30. Customer is aware that a LICENSED electrician is required to connect and configure the PCU, breaker panel, and bypass switch. The licensed electrician will be responsible for conforming to local and National electrical codes.

[ ] yes [ ] no [ ] not complete (describe in Section H)

31. Customer understands that any use of dual power grid to the A7000 must be 100% phase-synchronized at all times (including during generator operation).

(Exception: Automatic transfer Switch may be utilized to select 1 of 2

grids.)

[ ] yes [ ] no [ ] not complete (describe in Section H)

32. Is emergency power-off (EPO) capability required by the customer? (if yes, optional EPO RS232 breakout cable needed)

[ ] yes [ ] no [ ] not complete (describe in Section H)

D) ENVIRONMENTAL REQUIREMENTS:
---

33. Temperature and humidity are controlled within limits?

[ ] yes [ ] no [ ] not complete (describe in Section H)

34. Lighting/emergency lighting is sufficient?

[ ] yes [ ] no [ ] not complete (describe in Section H)

35. Air quality and ventilation is appropriate? NOTE: UPS cannot be operated in a sealed room.

[ ] yes [ ] no [ ] not complete (describe in Section H)

36. Fire/smoke alarm and extinguishing system installed?

[ ] yes [ ] no [ ] not complete (describe in Section H)

37. Area Security measures are appropriate?

[ ] yes [ ] no [ ] not complete (describe in Section H)

38. No unusual detrimental conditions evident? If noted, contact Customer Service Technical Support for assistance.

[ ] yes [ ] not complete (describe in Section H)

E) A7000 SOFTWARE REQUIREMENTS

Note: When adding and expansion cabinet, the A7000 software must be at a minimum System Baseline of 3.6.4.

F) REMOTE SUPPORT REQUIREMENTS:
---

39. Dedicated remote support phone line installed?

[ ] yes [ ] not complete (describe in Section H)

40. Telephone installed (voice line) near A7000 console?

[ ] yes [ ] no [ ] not complete (describe in Section H)

G) MAINFRAME HOST REQUIREMENTS:
---

41. Mainframe host system make/model number? _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

42. Mainframe channel type/number?
[ ] ESCON _____ [ ] BMC _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

43. Mainframe cable requirements?
[ ] ESCON qty ____ length _____ [ ] BMC qty ____ length _____

[ ] yes [ ] no [ ] not complete (describe in Section H)

H) OPEN ITEMS
---

44. Has access to the customer site been provided to complete this Site Planning Checklist?

[ ] Yes [ ] No

If NO, detail the contingency provision for the completion of the checklist.

45. Detail each question previously checked "not complete" and describe the contingency plan for completion.

Question number:
Comments/contingency plan:

Question number:
Comments/contingency plan:

Question number:
Comments/contingency plan:

Question number:
Comments/contingency plan:

Question number:
Comments/contingency plan:

Question number:
Comments/contingency plan:

This site [ ] has SATISFIED the requirements
[ ] must COMPLETE open items to satisfy the requirements

Signature _____ Date _____

Glossary

ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
AWG	American wire gauge
BBM	break before make
Btu	British thermal unit
CA	channel adapter
CFM	cubic feet per minute
cm	centimeter
CSA	Canadian Standards Association
db	a measure of relative energy (signal strength; amplitude of sound) between initial condition and a final condition
deg C	degree Celsius (centigrade,°C)
deg F	degree Fahrenheit (°F)
EPO	emergency power off
ESD	electrostatic discharge
FCC	Federal Communications Commission
FIPS	Federal Information Processing Standards
ft	foot
ft^2	square foot
ft^3	cubic foot
G	gravitational force

GB	gigabyte
hr	hour
HDSA	high density storage array
HVAC	heating, ventilation, and air-conditioning
Hz	Hertz (cycles per second)
IEC	International Electrotechnical Commission
in	inch
K**B**	kilobyte
kg	kilogram
kW	kilowatt
lb	pound
m	meter
mils	universal unit of measure equal to one-thousandth of an inch
mm	millimeter
$\mathbf{m}^2$	square meter
$\mathbf{m}^3$	cubic meter
MBB	make before break
NFPA	National Fire Protection Agency
NIOSH	National Institute for Occupational Safety and Health
PCU	power conditioning unit
PTT	Postal Telephone and Telegraph
REN	Ringer equivalence number
R&S	Russell and Stoll
UL	Underwriters Laboratories
V	volts
V ac	volts alternating current
V dc	volts direct current
VDE	Verband Deutscher Elektrotechniker

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