



Sun™ Storage 6180 Array Site Preparation Guide

Sun Microsystems, Inc.
www.sun.com

Part No. 821-0133-10
October 2009, Revision A

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Contents

Preface vii

1. Planning for the Installation 1

Customer Obligations 1

Safety Information 1

 Handling Precautions 2

 Secure Installation Requirements 2

 Placement of a Sun Product 2

Site Wiring and Power Requirements 3

2. Cabinet and Rack Specifications 5

Sun StorEdge Expansion Cabinet 5

 Physical Specifications 6

 Clearance and Service 6

 Weight 6

 Environmental Requirements 8

 Environmental Specifications 8

 Airflow and Heat Dissipation 8

 Power Requirements 9

Sun Fire Cabinet 9

Physical Specifications	10
Clearance and Service	10
Weight	10
Environmental Requirements	12
Temperature, Humidity, and Altitude	12
Airflow and Heat Dissipation	12
Power Requirements	13
Sun Rack II Cabinet	14
Cabinet Dimensions and Weight	14
Access Route Guidelines	15
Expansion Rack	15
Configuration Weight	16
Power Requirements	16
Power Distribution	17
Circuit Breaker Capacity and Characteristics	17
Environmental Requirements	17
Airflow and Heat Dissipation	18
Sun Rack 900/1000 Cabinets	18
Physical Specifications	19
Weight	19
Environmental Requirements	21
Temperature, Humidity, and Altitude	21
Airflow and Heat Dissipation	21
Power Requirements	21
3. Sun Storage 6180 Array Specifications	23
Physical Requirements	23
Dimensions	23
Weight	24

Environmental Requirements	24
Electrical Requirements	25
Site Wiring and Power	25
Power Input	26
Power Cords and Receptacles	26
A. Configuration Worksheets	27
Index	29

Preface

The *Sun™ Storage 6180 Array Site Preparation Guide* describes facilities and system requirements for installing the Sun Storage 6180 array. Follow the guidelines as outlined in this document when planning your installation.

Before You Read This Book

Before you begin to install the Sun Storage 6180 Array, you must have already read the regulatory and safety requirements described in this book:

- *Sun Storage 6180 Array Safety and Compliance Manual*

Related Documentation

Title	Part Number
<i>Sun Storage 6180 Array Safety and Compliance Manual</i>	821-0138
<i>Sun Storage 6180 Array Release Notes</i>	821-0265
<i>Sun Storage 6180 Array Rack-Ready Getting Started Guide</i>	821-0134
<i>Sun Storage 6180 Array Hardware Installation Guide</i>	821-0135
<i>Sun Modular Storage Rail Kit Installation Guide</i>	820-5774

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Sun Storage 6180 Array Site Preparation Guide, part number 821-0133-10.

Planning for the Installation

This chapter describes the requirements for preparing the customer site for installation of the Sun Storage 6180 Array. It contains the following sections:

- [“Customer Obligations” on page 1](#)
- [“Safety Information” on page 1](#)
- [“Site Wiring and Power Requirements” on page 3](#)

Customer Obligations

The customer is obliged to inform Sun Microsystems, Inc. of any and all ordinances and regulations that might affect the installation. The customer is responsible for meeting all government codes and regulations concerning facilities. The customer is also required to do the following:

- Comply with all local, national, and international codes covered in this specification. The subjects covered include fire and safety, building, and electrical codes.
- Document and inform Sun Microsystems, Inc. of any deviations from this specification.

Safety Information

Install the Sun Storage 6180 Array in accordance with the local safety codes and regulations at the facility site. Make sure that you read the safety precautions in the *Sun Storage 6180 Array Regulatory and Safety Compliance Manual*.

The following sections contain additional safety information for the local facility:

- “Handling Precautions” on page 2
- “Secure Installation Requirements” on page 2
- “Placement of a Sun Product” on page 2

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

Handling Precautions



Caution – A fully populated cabinet can weigh in excess of 1500 pounds (682 kg). Ensure that all surfaces this system will move over can withstand this load.

The cabinet is equipped with wheels so you can move it. Use enough personnel when moving the cabinet, especially on sloped loading docks and ramps, to gain access to a raised computer room floor. Move the cabinet slowly and deliberately, and make sure that the floor is free from foreign objects and cables that the cabinet could roll over.



Caution – To avoid injury, wear protective footwear when moving a system.

Secure Installation Requirements

To minimize personnel injury in the event of a seismic occurrence, you must securely fasten the cabinet to a rigid structure extending from the floor to the ceiling, or from the walls, of the room in which the cabinet is located.

Install the cabinet on a level surface. At each corner, on the base of the cabinet, are adjustable nonskid pads. Extend these pads when the cabinet is installed to prevent the cabinet from rolling. Do not use these pads to level the cabinet.

Placement of a Sun Product

Allow enough room surrounding the cabinet for access to the cabinet and arrays for maintenance.



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.

Air cools the system cabinets from front to back. Air enters at the front, circulates, and is expelled at the back of the cabinet. The front and back door clearances provide sufficient space for cooling. See [Chapter 2](#) for specific clearance specifications.

Site Wiring and Power Requirements

The AC power distribution boxes in the cabinet use common industrial wiring. Consider the following information when preparing the cabinet installation site:

- **AC power source** – The AC power source must provide the correct voltage, current, and frequency specified on the module model and serial number label.
- **Earth ground** – Site wiring must include an earth ground connection to the AC power source.
- **Circuit overloading** – Power circuits and associated circuit breakers must provide sufficient power and overload protection. To prevent possible damage to the AC power distribution boxes and other components in the cabinet, use an external, independent power source that is isolated from large switching loads (such as air conditioning motors, elevator motors, and factory loads).
- **Module power distribution** – All units attached to the two accessory outlets inside that cabinet must be auto-ranging between 180 and 264 VAC, 50-60 Hz.
- **Power interruptions** – The cabinet and modules will withstand the following applied voltage interruptions (with or without an integrated uninterruptible power supply [UPS]):
 - **Input transient** – 50% of nominal voltage
 - **Duration** – one-half cycle
 - **Maximum frequency** – once every ten seconds
- **Power failures** – If a total power failure occurs, when power is restored the modules within the cabinet automatically perform a power-up recovery.

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Cabinet and Rack Specifications

The Sun Storage 6180 Array can be installed in any NEBS-compliant, standard 19" 4-post cabinet with 24-26" spacing between posts. This includes all StorEdge Expansion, SunFire, Sun Rack II, and Sun Rack 900/1000 cabinets. This chapter describes the physical, environmental, and electrical requirements for these cabinets, as follows:

- ["Sun StorEdge Expansion Cabinet" on page 5](#)
- ["Sun Fire Cabinet" on page 9](#)
- ["Sun Rack II Cabinet" on page 14](#)
- ["Sun Rack 900/1000 Cabinets" on page 18](#)

To ensure safe and proper operation of the system, and ease of maintenance, make sure that all of these requirements have been met before beginning the installation of the cabinet.

Sun StorEdge Expansion Cabinet

This section describes the physical, electrical, and environmental requirements for the Sun StorEdge Expansion cabinet.

The floor area at the installation site must provide enough stability to support the weight of the cabinet and installed trays, sufficient space for installation and servicing of the cabinet and components, and sufficient ventilation to provide a free flow of air to the cabinet.

Physical Specifications

[TABLE 2-1](#) provides the physical dimensions of the Sun StorEdge expansion cabinet.

TABLE 2-1 Sun StorEdge Expansion Cabinet Dimensions

Height	Width	Depth	Empty Weight
73.5 in.	24 in.	36.5 in.	350 pounds
187 cm	61 cm	93 cm	159 kg

Clearance and Service

[TABLE 2-2](#) lists cabinet clearance and service access requirements.

TABLE 2-2 Clearance and Service Access

Location	With Service Access	Without Service Access
Front	48 in.	24 in.
	122 cm	61 cm
Rear	36 in.	24 in.
	92 cm	61 cm
Left	36 in.	2 in.
	92 cm	5.1 cm
Right	36 in	0
	92 cm	0

Weight

The total weight of a populated Sun StorEdge Expansion cabinet depends on the number and type of modules installed in the cabinet. [TABLE 2-3](#) lists the weight of an empty cabinet and the maximum weight of each component. Use these weights to

estimate the total weight of your system, based on the number of modules installed in the cabinet. Record the total weight in an easy-to-find place to reference when checking flooring load or elevator weight restrictions.

TABLE 2-3 Sun StorEdge Expansion Cabinet and Component Weights

Component	Quantity	Weight (each)	Total Component Weight (lbs or kg)
Cabinet (empty with 2 power sequencers))	1	X 350 lbs (159 kg)	= 350 lbs or 159 kg
Chassis, front cage, and midplane		X 36.1 lbs (16.4 kg)	=
Controller		X 4.9 lbs (2.2 kg)	=
Controller tray (empty, without drives)		X 1.2 lbs (0.5 kg)	=
Disk drive		X 1.65 lbs (0.75 kg)	=
Expansion tray (empty, without drives)		X 4.15 lbs (1.88 kg)	=
Front cage and midplane assembly		X 9.1 lbs (4.2 kg)	=
Power supply		X 7.95 lbs (3.60 kg)	=
SATA drive		X 2.29 lbs (1.04 kg)	=
Chassis, 2 power supplies, 2 expansions trays		X 61 lbs (27.7 kg)	=
Chassis, 2 power supplies, 2 expansions trays, and 16 drives		X 86.7 lbs (39.5 kg)	=
Chassis, 2 power supplies, 2 controls, and 2 controller trays		X 64.2 lbs (29.2 kg)	=
Chassis, 2 power supplies, 2 controls, 2 controller trays, and 16 drives		X 90.6 lbs (41.2 kg)	=
Total Weight			=

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing the cabinet.

Environmental Specifications

TABLE 2-4 lists operating and nonoperating temperature, relative humidity, and altitude ranges for the Sun StorEdge Expansion cabinet.

TABLE 2-4 Cabinet Environmental Specifications

Specification	Operating	Nonoperating
Temperature	41° F to 95° F (5° C to 35° C)	-40° F to -150.8° F (-40°C to -66° C)
Relative humidity (RH)	10% to 90% noncondensing	93% noncondensing
Altitude	9,840 feet (3000 m)	39,370 feet (12,000 m)
Shock (from any axis X, Y, or Z)	3.0 g for maximum duration of 11 ms, half-sine	1.0-in. roll-off freefall, front-to-back rolling directions
Vibration (from any axis X, Y, or Z)	0.15 g on z-axis; 0.10 g on x- and y-axes; 5 to 500 Hz sinusoidal	0.5 g on z-axis; 0.25 g on x- and y-axes; 5 to 500 Hz sinusoidal

Airflow and Heat Dissipation

Cabinet airflow is from front to back. Allow at least 30 inches in front of the cabinet, and at least 24 inches behind the cabinet, for service clearance, proper ventilation, and heat dissipation.

Power Requirements

The AC power sources must provide the correct voltage, current, and frequency specified on the module model and serial number label. The cabinet can run within the limits shown in [TABLE 2-5](#).

TABLE 2-5 Sun StorEdge Expansion Cabinet AC Power Requirements

Parameter	Requirements
AC voltage rating	200 to 240 VAC
AC voltage range	180 to 264 VAC
Frequency range	50 to 60 Hz
Current at 240 VAC	24A
Power consumption	5.4 kW

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Sun Fire Cabinet

This section describes the physical, electrical, and environmental requirements for the Sun Fire 6800 cabinet.

The floor area at the installation site must provide enough stability to support the weight of the cabinet and installed trays, sufficient space for installation and servicing of the cabinet and components, and sufficient ventilation to provide a free flow of air to the cabinet.

Physical Specifications

TABLE 2-6 provides the physical dimensions of the Sun Fire cabinet.

TABLE 2-6 Sun Fire Cabinet Dimensions

Height	Width	Depth	Empty Weight
75 in.	24 in.	53 in.	325 pounds
190.5 cm	61 cm	134.6 cm	147 kg

Clearance and Service

Sun Fire cabinets can be placed next to each other, without space between them, since there are no side clearance requirements during operation. However, if access is desired for removal of side panels, allow approximately 2 feet (60 centimeters) of space on each side.

TABLE 2-7 lists cabinet clearance and service access requirements.

TABLE 2-7 Clearance and Service Access

Location	With Service Access
Front	48 in.
	122 cm
Rear	36 in.
	92 cm

Weight

The total weight of a populated Sun Fire cabinet depends on the number and type of modules installed in the cabinet. TABLE 2-8 lists the weight of an empty cabinet and the maximum weight of each component. Use these weights to estimate the total

weight of your system, based on the number of modules installed in the cabinet. Record the total weight in an easy-to-find place to reference when checking flooring load or elevator weight restrictions.

TABLE 2-8 Sun Fire Cabinet and Component Weights

Component	Quantity	Weight (each)	Total Component Weight (lbs or kgs)
Cabinet (empty)	1	X 325 lbs (147 kg)	= 375 lbs or 147 kg
Chassis, front cage, and midplane		X 36.1 lbs (16.4 kg)	=
Controller		X 4.9 lbs (2.2 kg)	=
Controller tray (empty, without drives)		X 1.2 lbs (0.5 kg)	=
Disk drive		X 1.65 lbs (0.75 kg)	=
Expansion tray (empty, without drives)		X 4.15 lbs (1.88 kg)	=
Front cage and midplane assembly		X 9.1 lbs (4.2 kg)	=
Power supply		X 7.95 lbs (3.60 kg)	=
SATA drive		X 2.29 lbs (1.04 kg)	=
Chassis, 2 power supplies, and 2 expansions trays		X 61 lbs (27.7 kg)	=
Chassis, 2 power supplies, 2 expansions trays, and 16 drives		X 86.7 lbs (39.5 kg)	=
Chassis, 2 power supplies, 2 controls, and 2 controller trays		X 64.2 lbs (29.2 kg)	=
Chassis, 2 power supplies, 2 controls, 2 controller trays, and 16 drives		X 90.6 lbs (41.2 kg)	=
Total Weight			=

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing the cabinet.

Temperature, Humidity, and Altitude

TABLE 2-9 lists operating and nonoperating relative humidity, and altitude ranges for the Sun Fire cabinet. The table also provides the optimum operating condition in the recommended operating environment. Operating computer equipment for extended periods of time at or near the temperature or humidity extremes is known to significantly increase the failure rate of hardware components.

TABLE 2-9 Cabinet Temperature, Humidity, and Altitude

Specification	Optimal	Operating	Nonoperating
Temperature	70°F to 73.5°F (21°C to 23°C)	41°F to 95°F (5°C to 35°C)	-40°F to 140°F (-20°C to -60°C)
Relative humidity (RH)	45% to 50%	20% to 80% noncondensing	5% to 95% noncondensing
Altitude	0 to 9,840 feet (0 to 3 km)	0 to 9,840 feet (0 to 3 km)	0 to 39,370 feet (0 to 12 km)

Note: If you plan to operate a storage array at an altitude between 1000 m to 3000 m (3280 ft to 9842 ft) above sea level, lower the environmental temperature 1.7°C (3.3°F) for every 1000 m (3280 ft) above sea level.

Airflow and Heat Dissipation

The air intake screens act as electro-magnetic interference (EMI) and radio frequency interference (RFI) filters, stopping both EMI and RFI emissions from the system. These screens are honeycomb screens, which also collect and trap dust and debris particles.

The Sun Fire cabinet's air intake screens require periodic inspection and cleaning. To prevent restricted airflow and possible equipment failure, inspect the air intake screens for debris and trapped particles every three months of operation. Consider the level of debris on the screens and surrounding area in the decision as to when to remove and clean the air intake screens.

Power Requirements

The AC power sources must provide the correct voltage, current, and frequency specified on the module model and serial number label. The cabinet can run within the limits shown in [TABLE 2-10](#).

TABLE 2-10 Sun Fire Cabinet AC Power Requirements

Parameter	Requirements
AC voltage range	200 to 240 VAC
Current maximum	34A at 208 VAC
Current frequency range	47 to 63 Hz
Input power rating	6,460 W
Volt-ampere rating	6,800 VA
BTU rating	22,030 BUT/hr
Power factor	0.95 (with Sun products)
Connector type (one for each RTS installed; minimum of 2, maximum of 4)	4 - NEMA L6-30P for 200–240 VAC (North American) 4 - 32A, single-phase IEC (309, for 200–240 VAC* (International)
Receptacle type (one for each power cord installed)	4 - NEMA L6-30R for 200–240 VAC (North American)

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Sun Rack II Cabinet

This section describes the physical, electrical, and environmental requirements for the Sun Fire II cabinet.

The floor area at the installation site must provide enough stability to support the weight of the cabinet and installed trays, sufficient space for installation and servicing of the cabinet and components, and sufficient ventilation to provide a free flow of air to the cabinet.

The Sun Rack II Cabinet is 120 cm (47 in.) deep, 60 cm (23.6 in.) wide, and provides 42U¹ (186.7 cm—73.5 in.) of equipment space. It has a weight of 190 kg (420 lb) with a capacity for holding up to 907 kg (2000 lb) of equipment.

Note – Both the Sun 6180 controller module and the disk array trays conform to the 48.3-cm (19-in.) rack standard. For more information see the Sun Rack II User’s Guide.

Cabinet Dimensions and Weight

TABLE 2-11 Sun Rack Nominal Weight and Space Requirements

Dimension	Measurement
Maximum allowable weight of installed rack equipment	907 kg (2000 lb) Average of 21.7 kg (48 lb) per rack unit
Maximum allowable weight of installed power distribution units	14.5 kg (32 lb)
Maintenance access requirement for rear	91.4 cm (36 in.)
Maintenance access requirement from top	91.4 cm (36 in.)
Air flow requirement for left and right sides	None (front-to-back cooling)

1. U = Rack Units. A rack unit or U (less commonly, RU) is a unit of measure used to describe the height of equipment intended for mounting in a 19-inch rack. One rack unit, as defined by EIA 310-D is 4.45cm(1.75 in) high.

Access Route Guidelines

Moving the rack to the installation site:

- If the existing loading dock meets height and ramp requirements for a standard freight carrier truck, you can use a pallet jack to unload the rack.
- If not, you must provide a standard forklift or other means to unload the rack, or request the rack be shipped in a truck with a lift gate.

Note – Leave the rack in its shipping packaging until it reaches its final destination. The entire access route to the installation site should be free of obstructions and raised patterns that can cause vibration.

TABLE 2-12 Sun Rack Cabinet Shipping Dimensions

Package Dimension	Sun Rack II 1242 Standard Packaging	Sun Rack II 1242E Enterprise Packaging
Shipping height	214.5 cm (84.5 in.)	215.9 cm (85.0 in.)
Shipping width	77.0 cm (30.31 in.)	121.9 cm (48.0 in.)
Shipping depth	112.5 cm (44.13 in.)	157.5 cm (62.0 in.)
Shipping weight	Varies by configuration	Varies by configuration
Shipping weight (Packaging)	31 kg (68.34 lb)	120.2 kg (265 lb)
Minimum door height	218.4 cm (86 in.)	200 cm (78.7 in.)
Minimum door width	122 cm (48 in.)	60 cm (23.6 in.)
Minimum elevator depth	157.5 cm (62 in.)	120 cm (47.3 in.)
Maximum incline	6°	6°

Expansion Rack

Depending on the configuration, an additional rack can be placed next to the master rack to obtain a fully configured system. This configuration would consist of one rack with the controller tray and 12 drive trays, then 4 additional drive trays in the second or expansion rack.

Note – Longer customer supplied Fibre Channel cables are needed with this configuration for connecting the expansion trays to the controller in the master rack.

Configuration Weight

TABLE 2-17 lists the weight of an empty cabinet and the maximum weight of each component.

Use these weights to estimate the total configuration weight of your system based on the number of modules installed. Record the total weight in the table and use it as a reference when checking floor loading or elevator weight restrictions.

TABLE 2-13 Sun Rack Cabinet and Component Weights

Component	Qty	Weight (each)		Total Weight	
		kg	lb	kg	lb
Cabinet (empty)	1 x	150.5 kg	(332 lb)	= 150.5	332
Half Height PDUs	4 x	3.6 kg	(8 lb)	= 14.4	32
Controller tray	1 x	36.8 kg	(81.1 lb)	= 36.8	81.1
Expansion tray (fully populated) (from 1 to 12 trays)	x	38 kg	(85 lb)	=	
Total Weight				=	

Power Requirements

The AC power sources must provide the correct voltage, current, frequency, and connectors specified on the module type and serial number label.

The following guidelines are a best practice when determining power requirements:

- Use dedicated AC breaker panels for all power circuits that supply power to the PDU.
- Electrical work and installations must comply with applicable local, state, or national electrical codes.
- Contact your facilities manager or a qualified electrician to determine what type of power is supplied to your building.

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Power Distribution

The design of this rack includes four Sun Storage, half-height, 5 kVA² power distribution units (PDUs) that creates a dual grid power system. This power system consists of four power strips, using separate 30 Amp circuits. Each with 12 outlets, protected by two circuit breakers for a total of 48 outlets, or 24 outlets per grid.

Each circuit requires:

TABLE 2-14 Power Requirements

Requirement	Value
Input Power	180 to 264 VAC
Frequency	47 to 63 Hz
Power connectors	NEMA L6-3 30R domestic or EIC 309 32A for International

Circuit Breaker Capacity and Characteristics

Each Sun Rack II requires its own customer-supplied circuit breaker and AC receptacle for each power input cord. Provide a stable power source, such as an uninterruptible power system (UPS), to reduce the possibility of component failures.

If the computer equipment is subjected to repeated power interruptions and fluctuations, it is susceptible to a higher component failure rate than it would be with a stable power source.

Environmental Requirements

This section describes the environmental conditions for the Sun Rack II cabinet.

Note – *Typical Sun equipment environmental requirements that mount in a Sun Rack II.* Although most computer equipment is designed to operate in environmental conditions of 20% to 80% humidity, industry best practices recommends computer rooms maintain a relative humidity of 40% to 50% for best performance.

TABLE 2-15 lists operating and non-operating temperature, relative humidity, and altitude ranges for the Sun Rack II cabinet.

2. Kilo volt-ampere. To convert kVA to kW (use the equation $kVA = kW/PF$) where PF = power factor. For example, if the power factor is 0.6, the equation would be $120\text{ kVA} \cdot 0.6 = 72\text{ Kilowatts}$

TABLE 2-15 Cabinet Temperature, Humidity, and Altitude

Specification	Operating	Non-operating
Temperature	10°C to 40°C (32°F to 104°F)	-40°C to 65°C (-40°F to 149°F)
Relative humidity (RH)	20% to 80% non-condensing	5% to 95% non-condensing
Altitude	0 to 3 km (0 to 10,000 ft)	0 to 12 km (0 to 40,000 ft)

Note: If you plan to operate a storage array at an altitude between 1000 m to 3000 m (3280 ft to 9842 ft) above sea level, lower the environmental temperature 1.7°C (3.3°F) for every 1000 m (3280 ft) above sea level.

Airflow and Heat Dissipation

Cabinet airflow is from the front to the back.

Allow at least 76 cm (30 in.) in front of the cabinet, and at least 61 cm (24 in.) behind the cabinet, for service clearance, proper ventilation, and heat dissipation.

Sun Rack 900/1000 Cabinets

This section describes the physical, electrical, and environmental requirements for the Sun Rack 900/1000 cabinets.

The floor area at the installation site must provide enough stability to support the weight of the cabinet and installed trays, sufficient space for installation and servicing of the cabinet and components, and sufficient ventilation to provide a free flow of air to the cabinet.

Physical Specifications

TABLE 2-16 provides the physical dimensions and weight of the Sun Rack 900-38, 900-36N, and 1000-38 cabinets.

TABLE 2-16 Sun Rack 900/1000 Cabinet Dimensions and Weight

Model	Height	Width	Depth	Empty Weight
Sun Rack 900-38	74 in. (188 cm)	23.5 in. (59.7 cm)	35.4 in. (900 mm)	360 pounds (163.3 kg)
Sun Rack 900-36N	74 in. (188 cm)	23.5 in. (59.7 cm)	35.4 in. (900 mm)	380 pounds (172.7 kg)
Sun Rack 1000-38	74 in. (188 cm)	23.5 in. (59.7 cm)	39.4 in. (1000 mm)	360 pounds (163.3 kg)

Weight

The total weight of a populated Sun Rack 900/1000 cabinet depends on the number and type of modules installed in the cabinet. TABLE 2-17 lists the weight of an empty cabinet and the maximum weight of each component. Use these weights to estimate the total weight of your system, based on the number of modules installed in the cabinet. Record the total weight in an easy-to-find place to reference when checking flooring load or elevator weight restrictions.

TABLE 2-17 Sun Rack 900/1000 Cabinet and Component Weights

Component	Quantity	Weight (each)	Weight (lbs or kg)
Cabinet (empty with 2 power sequencers)	1	X	360 lbs (163.3 kg) or 380 lbs (172.7 kg)
Chassis, front cage, and midplane		X	36.1 lbs (16.4 kg)
Controller		X	4.9 lbs (2.2 kg)
Controller tray (empty, without drives)		X	1.2 lbs (0.5 kg)
Disk drive		X	1.65 lbs (0.75 kg)
Expansion tray (empty, without drives)		X	4.15 lbs (1.88 kg)

TABLE 2-17 Sun Rack 900/1000 Cabinet and Component Weights *(Continued)*

Component	Quantity	Weight (each)	Weight (lbs or kg)
Front cage and midplane assembly	X	9.1 lbs (4.2 kg)	=
Power supply	X	7.95 lbs (3.60 kg)	=
SATA drive	X	2.29 lbs (1.04 kg)	=
Chassis, 2 power supplies and 2 expansions trays	X	61 lbs (27.7 kg)	=
Chassis, 2 power supplies, 2 expansions trays, and 16 drives	X	86.7 lbs (39.5 kg)	=
Chassis, 2 power supplies, 2 controls, and 2 controller trays	X	64.2 lbs (29.2 kg)	=
Chassis, 2 power supplies, 2 controls, 2 controller trays, and 16 drives	X	90.6 lbs (41.2 kg)	=
Total Weight			=

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing Sun Rack cabinets.

Temperature, Humidity, and Altitude

[TABLE 2-18](#) lists operating and nonoperating temperature, relative humidity, and altitude ranges for the Sun Rack 900/1000 cabinets.

TABLE 2-18 Cabinet Temperature, Humidity, and Altitude

Specification	Operating	Nonoperating
Temperature	41°F to 95°F (5°C to 35°C)	-40°F to 150.8°F (-40°C to -66°C)
Relative humidity (RH)	20% to 80% noncondensing	5% to 95% noncondensing
Altitude	0 to 9,840 feet (0 to 3 km)	0 to 39,370 feet (0 to 12 km))

Airflow and Heat Dissipation

Cabinet airflow is from front to back. Allow at least 30 inches in front of the cabinet, and at least 24 inches behind the cabinet, for service clearance, proper ventilation, and heat dissipation.

Power Requirements

The AC power sources must provide the correct voltage, current, and frequency specified on the module model and serial number label. The cabinet can run within the limits shown in [TABLE 2-19](#).

TABLE 2-19 Cabinet AC Power Requirements

Parameter	Requirements
Nominal voltages	200 to 240 VAC
Operating voltage	180 to 240 VAC
Frequency range	47 to 63 Hz
Current	32A (2X 16A) maximum

TABLE 2-19 Cabinet AC Power Requirements (*Continued*)

Parameter	Requirements
AC power plug	NEMA L6-20P (North American) IEC 309 16A 3 Position (International)
AC power receptacle	NEMA L6-20R (North American) IEC 309 16A 3 Position (International)
Power cords required	4

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Sun Storage 6180 Array Specifications

This chapter describes the physical, environmental, and electrical requirements for the Sun Storage 6180 Array. It contains the following sections:

- [“Physical Requirements” on page 23](#)
- [“Environmental Requirements” on page 24](#)
- [“Electrical Requirements” on page 25](#)

Physical Requirements

The floor space at the installation site must be strong enough to support the combined weight of the cabinet, controller trays, expansion trays, and associated equipment. The site also requires sufficient space for installation, operation, and servicing the arrays and sufficient ventilation to provide a free flow of air to the unit.

Dimensions

[TABLE 3-1](#) provides the physical dimensions and weight of the array trays.

TABLE 3-1 Array Tray Dimensions

Height	Width	Depth	Weight (Fully Populated)
5.1 in.	19 in.	22.5 in.	85 pounds
12.95 cm	48.28 cm	57.15 cm	38.5 kg

Weight

The total weight of a controller tray or expansion tray depends on the number of drives installed.

The maximum weight of a fully populated controller or expansion tray is 95.0 pounds (43 kilograms).

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing the unit, and heat conditions that are generated by normal operation of the unit.

TABLE 3-2 lists the environmental conditions in which the module is designed to operate.

TABLE 3-2 Operating Environmental Conditions

Condition	Range
Temperature	10° C to 40° C (50° F to 104° F) without battery 10° C to 35° C (50° F to 95° F) with battery
Relative humidity	20% to 80% noncondensing
Altitude	100 feet (30.5 meters) below sea level to 9,840 feet (3,000 meters)
Shock	Operating: 10 G, 3.75ms half triangular Nonoperating: 20 G, 8.0 ms square wave in each direction along x, y, and z axis
Vibration	0.20 G, 5 to 500 Hz sinusoidal
Heat output	403 watts* (1380 BTU/hour)

* Based on a configuration of two power supplies, two expansion trays, and 16 drives (Seagate 15K.4 4GB)

TABLE 3-3 lists the nonoperating environmental conditions of the tray.

TABLE 3-3 Nonoperating Environmental Conditions

Condition	Range
Temperature (storage)	-10° C to 50° C (-14° F to 120° F) without battery -10° C to 45° C (-14° F to 113° F) with battery (3 month maximum)
Temperature (transit)	-40° C to 60° C (-40° F to 140° F) without battery -40° C to 60° C (-40° F to 140° F) with battery (1 week maximum)
Humidity (storage)	10% to 90%, maximum dew point is 26° C (79° F), 10% per hour gradient
Humidity (transit)	5% to 95%, maximum dew point is 26° C (79° F), 10% per hour gradient
Altitude	100 feet (30.5 meters) below sea level to 40,000 feet (12,000 meters)
Shock	30 G, 11 msec half sinewave in the side/side and up/down directions 5 G, 11 msec half sinewave in the front/back direction

Electrical Requirements

This section provides information regarding site power and wiring, module AC power requirements, and power cord routing instructions.

Site Wiring and Power

The tray uses wide-ranging redundant power supplies that automatically accommodate voltages to the AC power source. The power supplies operate within the range of 90 VAC to 264 VAC, at a minimum frequency of 50 Hz and a maximum frequency of 60 Hz. The power supplies meet standard voltage requirements for both domestic (inside USA) and international (outside USA) operation. They use standard industrial wiring with line-to-neutral or line-to-line power connections.

Power Input

The AC power sources must provide the correct voltage, current, and frequency specified on the tray model and serial number label. The tray can run without interruption within the limits shown in [TABLE 3-4](#).

TABLE 3-4 Tray AC Power Requirements

Condition	Specification
AC power (CU)	4.4 A maximum operating @ 100 VAC (90 VAC - 136 VAC range), 50/60 Hz
	1.9 A maximum operating @ 240 VAC (198 VAC - 264 VAC range), 50/60 Hz
AC power (EXP)	4.6 A maximum operating @ 100 VAC (90 VAC - 136 VAC range), 50/60 Hz
	1.95 A maximum operating @ 240 VAC (198 VAC - 264 VAC range), 50/60 Hz
Maximum operating current	1.4 A maximum operating @ 240 VAC (198 VAC - 264 VAC range), 50/60 Hz

DC Power

- An optional -48Vdc power is supplied by a centralized DC power plant.
- Site wiring must include a protective ground connection to the -48Vdc power source/plant.
- The nominal 6180 DC rating is -48 to -60Vdc with a tolerance of +20%, -15%.

Power Cords and Receptacles

All modules are shipped with two AC power cords that are appropriate for use in a typical outlet in the destination country.

Each power cord connects one of the power supplies in a module to an independent external power source, such as those provided in the supported Sun cabinets, a wall receptacle, or uninterruptible power supply (UPS).

Configuration Worksheets

Use the worksheets in this appendix to help you collect the information you need to perform the installation. Two worksheets are provided:

- “Sun Storage 6180 Array Configuration Worksheet” on page 27
- “Sun Storage 6180 Array Data Host Information” on page 28

TABLE A-1 lists the information you need to configure the array.

TABLE A-1 Sun Storage 6180 Array Configuration Worksheet

Controller A MAC address:	
Controller B MAC address:	
Controller A IP address:	
Controller B IP address:	
Management host IP address:	
Network mask:	
Name server domain name:	
IP address of the domain name server (DNS):	
Gateway IP address:	
Email notification address:	

TABLE A-2 lists the information you need to collect for each data host connected to the Sun Storage 6180 array.

TABLE A-2 Sun Storage 6180 Array Data Host Information

Host name:	
Vendor:	
Model:	
Operating system:	
Patch/Service pack:	
Number of HBAs:	
HBA World Wide Name (WWN):	
HBA model:	
HBA driver:	

Index

A

- altitude requirements, 8, 12, 18, 21, 24, 25
- array
 - installation planning for
 - data host information, 28
- array module
 - environmental requirements, 24
- array tray dimensions, 23

C

- cabinet
 - area requirements, 5, 23
 - circuit breaker, 9, 13, 21
 - compatibility, 5
 - power requirements, 13
 - site wiring requirements, 3
 - weight, 6, 10, 16, 19
- chassis
 - weight, 7
- controller
 - weight, 7
- controller trays
 - weight, 7
- cooling, 3
- customer responsibilities, 1

D

- disk drive
 - weight, 7

E

- earth ground, 3

- environmental requirements
 - array module, 24
- expansion trays
 - weight, 7

H

- hardware
 - installation planning, 27
 - placement, 2, 23
- heat output, 24
- humidity, 24, 25

I

- installation
 - hardware, 27
 - secure, 2

O

- operating current, maximum, 26
- operating temperature, 24, 25

P

- power
 - distribution, 3
 - failure, 3
 - interruptions, 3
 - source, 26
 - source (AC), 3
 - tray AC requirements, 26
- power cords, 26
- power requirements, cabinet, 9, 13, 21
- power supplies

- operating range, 25
- weight, 7
- wiring, 25

S

- safety precautions, 1
 - handling, 2
- SATA drive
 - weight, 7
- shock, 24, 25
- site wiring requirements, cabinet, 3
- StorEdge cabinet
 - airflow, 8
 - clearance, 6
 - dimensions, 6
 - power requirements, 9
 - temperature, humidity, altitude, 8
 - weight, 7
- Sun Fire cabinet
 - airflow, 12
 - clearance, 10
 - dimensions, 10
 - power requirements, 13
 - temperature, humidity, altitude, 12
 - weight, 11
- Sun Rack cabinet
 - airflow, 18, 21
 - clearance, 18, 21
 - dimensions, 19
 - power requirements, 21
 - temperature, humidity, altitude, 17, 21
 - weight, 16, 19
- Sun Rack II cabinet, 14
 - airflow, 18
 - dimensions, 14
 - environmental requirements, 17
 - expansion rack, 15
 - power requirements, 16
 - weight, 14, 16

T

- temperature requirements, 8, 12, 18, 21

V

- vibration, 24

W

- weight
 - cabinet, 6, 10, 16, 19
 - chassis, 7
 - controller, 7
 - controller tray, 24
 - controller trays, 7
 - disk drive, 7
 - expansion tray, 24
 - expansion trays, 7
 - power supplies, 7
 - SATA drive, 7
- worksheet
 - configuration, 27
 - data host, 28