SPARC Enterprise M3000 Server

Site Planning Guide

Part No.: E23585-02
Manual Code: C120-H030-06EN
March 2012

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Contents

Preface

This guide describes the physical, environmental, and electrical specification requirements for the SPARC Enterprise M3000 Server from Oracle and Fujitsu.

Due to the amount of time required to plan and properly prepare a site for installation of the server, you must fulfill all of the requirements outlined in this manual before your equipment arrives. References herein to the M3000 server are reference to the SPARC Enterprise M3000 server.

This preface includes the following sections:

Audience

This guide is written for experienced system administrators with working knowledge of computer networks and advanced knowledge of the Oracle Solaris Operating System (Oracle Solaris OS).

Related Documentation

All documents for your server are available online at the following locations.

Documentation	Link
Sun Oracle software-related manuals (Oracle Solaris OS, and so on)	http://www.oracle.com/documentation
Fujitsu documents	http://www.fujitsu.com/sparcenterprise/manual/
Oracle M-series server documents	http://www.oracle.com/technetwork/documentation/sparc-mseries-servers-252709.html

The following table lists titles of related documents.

Related SPARC Enterprise M3000 Server Documents
SPARC Enterprise M3000 Server Site Planning Guide
SPARC Enterprise Equipment Rack Mounting Guide
*SPARC Enterprise M3000 Server Getting Started Guide**
SPARC Enterprise M3000 Server Overview Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Important Legal and Safety Information *
SPARC Enterprise M3000 Server Safety and Compliance Guide
SPARC Enterprise M3000 Server Installation Guide
SPARC Enterprise M3000 Server Service Manual
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Administration Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Product Notes†
SPARC Enterprise M3000 Server Product Notes
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Glossary

* This is a printed document.

† Beginning with the XCP 1100 release.

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Font/Symbol	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font represents the example of command input in the frame.	`XSCF> adduser jsmith`

AaBbCc123	The names of commands, files, and directories; on-screen computer output.
	This font represents the example of command output in the frame.
		`XSCF> showuser -P`
		`User Name:  jsmith`
		`Privileges:  useradm`
		`auditadm`

Italic	Indicates the name of a reference manual, a variable, or user-replaceable text.	See the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.
" "	Indicates names of chapters, sections, items, buttons, or menus.	See Chapter 2, "System Features."

Notes on Safety

Read the following documents thoroughly before using or handling any SPARC Enterprise M3000 server:

- *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Important Legal and Safety Information*
- *SPARC Enterprise M3000 Server Safety and Compliance Guide*

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

- A variable that requires input of a value must be put in Italics.
- An optional element must be enclosed in [].
- A group of options for an optional keyword must be enclosed in [] and delimited by |.

Documentation Feedback

If you have any comments or requests regarding this document, go to the following websites:

- For Oracle users:

http://www.oracle.com/goto/docfeedback

Include the title and part number of your document with your feedback:

SPARC Enterprise M3000 Server Site Planning Guide, part number E23585-02

- For Fujitsu users:

http://www.fujitsu.com/global/contact/computing/sparce_index.html

CHAPTER 1

Before Setting Up the Server

This chapter explains the items that must be confirmed before installation of the SPARC Enterprise M3000 server.

Prior to server installation, confirm that the requirements in TABLE 1-1 have been met.

TABLE 1-1 Preinstallation Requirements

	Check item	Check
Server configuration	• Has the configuration of the server been determined?	
	• Has the total number of servers been determined?	
Training	• Have the system administrator and operators taken the necessary training courses?	
Environment	• Does the computer room environment meet the temperature and humidity specifications? (see Section 3.1, "Environmental Requirements" on page 3-1)	
	• Can the computer room environmental conditions be maintained and managed satisfactorily?	
	• Have appropriate security measures been taken for the computer room?	
	• Does the computer room have satisfactory fire control equipment in it?	
Facility power	• Have you confirmed the voltage for the equipment racks in which the server and peripheral devices are mounted?	
	• Has an adequate power supply facility been prepared for the server, monitors, and peripheral devices? (see Section 3.3, "Power Requirements" on page 3-6)	
	• Is the power supply facility within 3.5 m (11.5 ft) of the equipment rack?	

TABLE 1-1 Preinstallation Requirements *(Continued)*

	Check item	Check
Physical specifications	• Have the server installation locations been determined?	
	• Does the server layout meet the service clearance requirements of the server? (see Section 2.2.1, "Service Clearance" on page 2-3)	
	• Does the server layout preclude exhaust air from any device entering the air inlet of the server?	
Network specifications	• Have you obtained the necessary information for your network connections? (see Section 4.2, "Platform and Domain Setup Information" on page 4-2)	

CHAPTER 2

Server Specifications

This chapter explains the physical specifications of the M3000 server, including external dimensions, space requirements, and limitations.

2.1 Server Components

The M3000 server has been designed to be mounted in qualified equipment racks. For details of the mounting requirements, see the *SPARC Enterprise Equipment Rack Mounting Guide*.

FIGURE 2-1 shows external views of the M3000 server.

FIGURE 2-1 Front and Rear Views of the Server

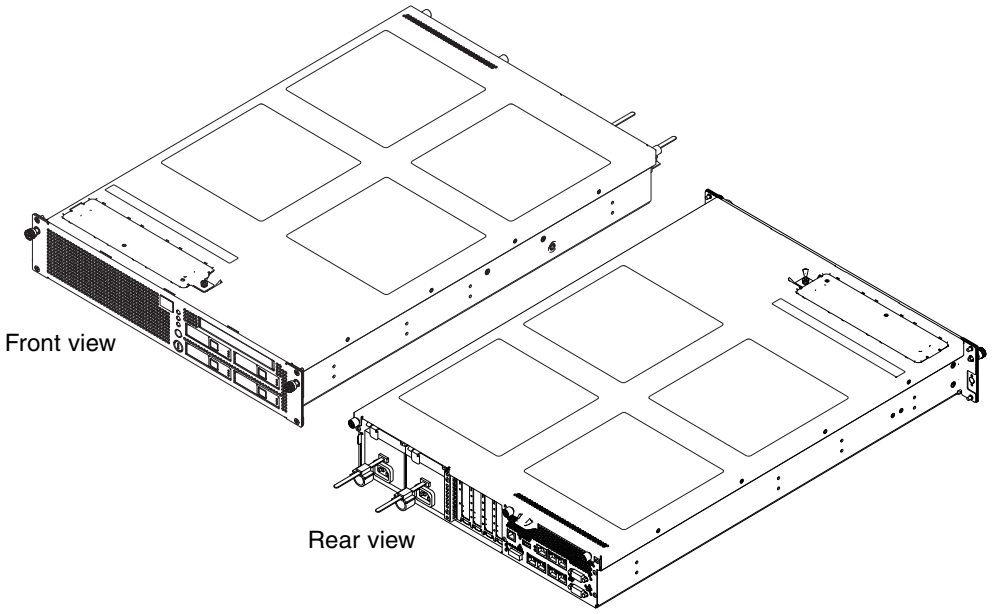


TABLE 2-1 lists the maximum configurations of the M3000 server.

TABLE 2-1 Components

Component	Maximum Number per Server
Motherboard unit	1
Memory module	8
PCI Express (PCIe) card	4
Hard disk drive	4
Hard disk drive backplane	1
CD-RW/DVD-RW drive unit	1
Power supply unit	2
Fan unit	2
Fan backplane	1
Operator panel	1

2.2 Server Installation Guidelines

As you plan the installation of the M3000 server mounted in an equipment rack, keep the following conditions in mind:

- Each server requires two power cords. Each power cord must be connected to a separate input power source. When using the dual power feed option, the power cords must be connected to separate power supply facilities.
- The power supply facility must meet the relevant electrical codes.

For details of the electrical requirements, see Section 3.3, “Power Requirements” on page 3-6."

For details of the server installation, see the *SPARC Enterprise M3000 Server Installation Guide*.

2.2.1 Service Clearance

The service clearance depends on the requirements for the rack used. For accurate service clearance measurements, see the *SPARC Enterprise Equipment Rack Mounting Guide*.

FIGURE 2-2 shows an example of the service clearance for the M3000 server mounted in a qualified equipment rack.

FIGURE 2-2 Example of the Service Clearance at the Front and Rear of Equipment Racks (Top View)

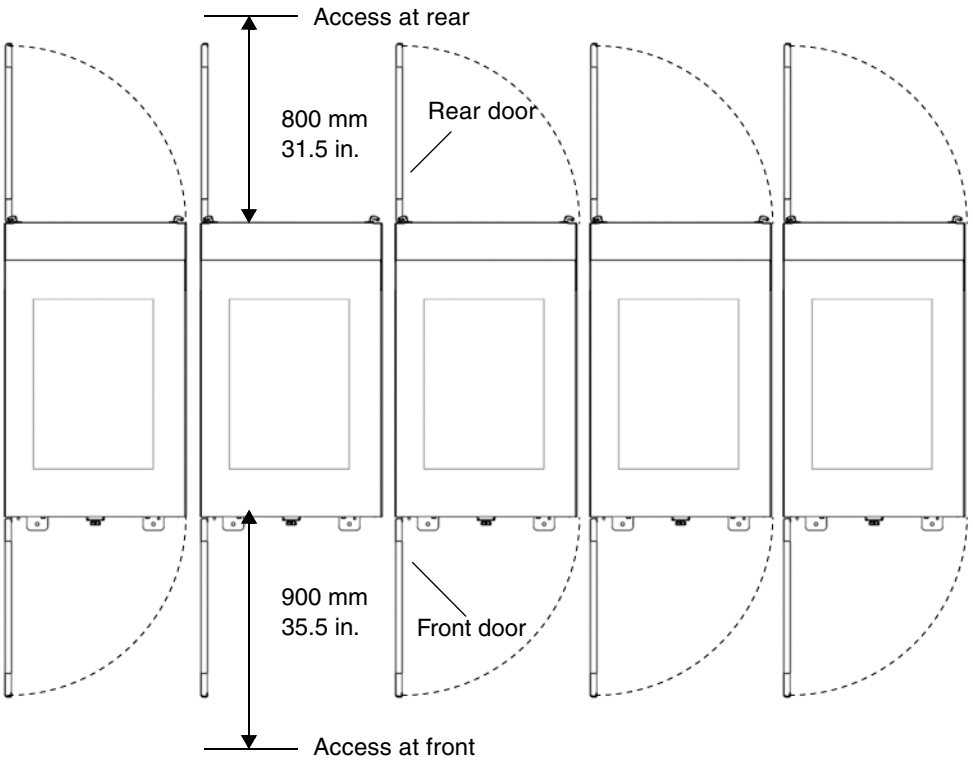


TABLE 2-2 lists physical specifications of the M3000 server.

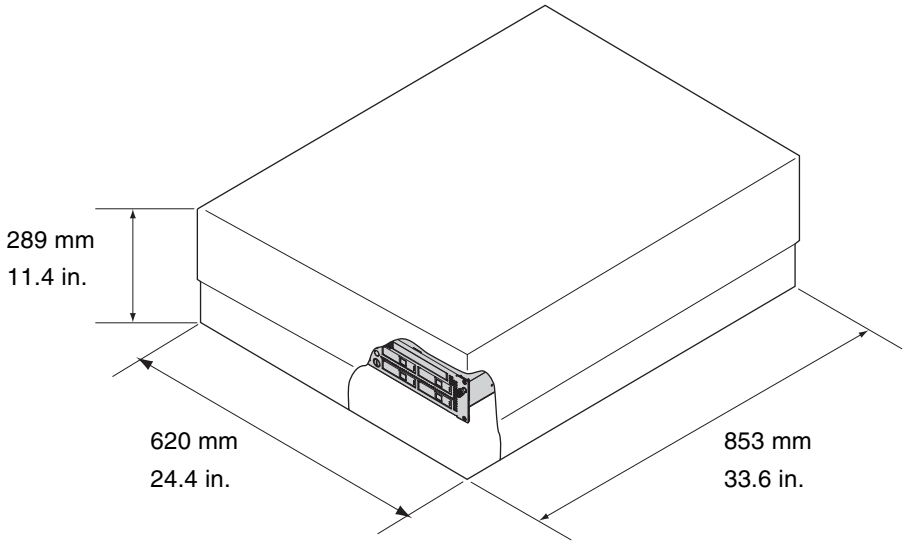
TABLE 2-2 Physical Specifications

Item	Specification	
	Container Box	Server
Height	289 mm/11.4 in.	87 mm/3.4 in.
Width	620 mm/24.4 in.	440 mm/17.4 in.
Depth	853 mm/33.6 in.	657 mm/25.9 in.
Weight	30 kg/66 lb	22 kg/48.5 lb*

* The weight of cables are not included.

FIGURE 2-3 shows the external dimensions of the M3000 server container box.

FIGURE 2-3 Server Container Box



2.2.2 Space for Thermal Clearance

The M3000 server mounted in an equipment rack must have the necessary thermal distance maintained between the rear of the server and any obstacles or walls. For thermal clearance requirements, see the *SPARC Enterprise Equipment Rack Mounting Guide*.

CHAPTER 3

Environmental and Electrical Specifications

This chapter explains the environmental and electrical requirements necessary for stable operation of the M3000 server.

3.1 Environmental Requirements

The M3000 server can be installed at a site that meets the environmental requirements described in TABLE 3-1.

Note – The design of your environmental control system—such as computer room air-conditioning units—must ensure that intake air to the server complies with the limits specified in this section.

The environmental requirements listed in TABLE 3-1 reflect the test results of the server. The optimum conditions indicate the recommended operating environment. Operating the server for extended periods at or near the operating range limits or installing the server in an environment where it remains at or near the non-operating range limits could possibly increase the failure rate of hardware components significantly. In order to minimize the occurrence of system failure due to component failure, set temperature and humidity in the optimal ranges.

To prevent overheating, the following requirements must be met:

- Protect against any warm air directed toward the front of the equipment rack.
- Protect against any warm air directed toward the front panel on the server.

TABLE 3-1 Environmental Requirements

	Operating Range	Non-Operating Range	Optimum
Ambient temperature	5°C to 35°C (41°F to 95°F)	Unpacked: 0°C to 50°C (32°F to 122°F) Packed: -20°C to 60°C (-4°F to 140°F)	21°C to 23°C (70°F to 74°F)
Relative humidity *	20% RH to 80% RH	to 93% RH	45% RH to 50% RH
Altitude restriction †	3,000 m (10,000 ft)	12,000 m (40,000 ft)	
Temperature conditions	5°C to 35°C (41°F to 95°F) 0 m to 500 m (0 ft to 1,640 ft)		
	5°C to 33°C (41°F to 91.4°F) 501 m to 1,000 m (1,644 ft to 3,281 ft)		
	5°C to 31°C (41°F to 87.8°F) 1,001 m to 1,500 m (3,284 ft to 4,921 ft)		
	5°C to 29°C (41°F to 84.2°F) 1,501 m to 3,000 m (4,925 ft to 9,843 ft)		

* There is no condensation regardless of the temperature and humidity.

† All altitudes are above sea level.

3.1.1 Ambient Temperature

The ambient temperature range of 21°C to 23°C (70°F to 74°F) is optimal for server reliability and operator comfort levels. It is easier to maintain safe associated relative humidity levels at this temperature range. Operating in this temperature range provides a safety buffer in the event the air conditioning systems go down for a period of time.

3.1.2 Ambient Relative Humidity

Ambient relative humidity levels between 45 percent and 50 percent are the most suitable for safe data processing operations. The reasons for this are as follows:

- The optimal range helps protect computer systems from corrosion problems associated with high humidity levels.
- The optimal range provides an operating time buffer in the event of an air conditioner control failure.
- The optimal range helps prevent failures or temporary malfunctions caused by the intermittent interference from the electrostatic discharge that may occur when the relative humidity is too low.

Electrostatic discharge is easily generated and less easily dissipated in areas where the relative humidity is below 35 percent. Electrostatic discharge becomes a critical issue when the humidity level drops below 30 percent. Compared to the guidelines used for typical office environments where room environment conditions are loosely controlled, the optimal relative humidity range is set for tighter control. However, this is not a difficult condition to meet for a server installed in a computer room, because a computer room normally has a high efficiency vapor barrier and low rate of air exchange.

3.1.3 Contamination Specifications

The allowable contaminations in the M3000 server are listed in TABLE 3-2.

TABLE 3-2 Specifications (Allowable Contamination)

Contamination	Tolerable Limit
Hydrogen sulfide (H_2S)	Up to 7.1 ppb
Sulfur dioxide (sulfur oxide) (SO_2)	Up to 37 ppb
Hydrogen chloride (HCI)	Up to 6.6 ppb
Chlorine (CI_2)	Up to 3.4 ppb
Hydrogen fluoride (HF)	Up to 3.6 ppb
Nitrogen dioxide (nitrogen oxide) (NO_2)	Up to 52 ppb
Ammonia (NH_3)	Up to 420 ppb
Ozone (O_3)	Up to 5 ppb

TABLE 3-2 Specifications (Allowable Contamination) *(Continued)*

Contamination	Tolerable Limit
Oil vapor	Up to 0.2 mg/m^3
Dust	Up to 0.15 mg/m^3
Seawater (salt damage)	The installation site shall not be within 0.5 km of the ocean or coastal areas (unless the computer room uses air conditioners to filter out airborne sea salt particles from outside air).

3.2 Cooling Specifications

This section explains the cooling conditions of the M3000 server.

In installing the server, note the following conditions:

- The room should have an adequate air-conditioning system that meets the cooling requirements of the entire server.
- The air-conditioning system should have controls that prevent excessive temperature changes.

TABLE 3-3 shows the cooling specifications of the fully configured M3000 server.

TABLE 3-3 Cooling Specifications

Configuration	CPU	Input Voltage	Maximum Heat Dissipation	Maximum Exhaust Airflow	Noise Level*
1 CPU, 64 GB memory	CPU: 2.52 GHz	100 VAC to 120 VAC	1,603.7 BTU/hr (1,692 kJ/hr)	1.75 m^3/min	47 dB
		200 VAC to 240 VAC	1,569.6 BTU/hr (1,656 kJ/hr)		
	CPU: 2.75 GHz	100 VAC to 120 VAC	1,723.1 BTU/hr (1,818 kJ/hr)		
		200 VAC to 240 VAC	1,707.9 BTU/hr (1,800 kJ/hr)		
	CPU: 2.86 GHz	100 VAC to 120 VAC	1,723.1 BTU/hr (1,818 kJ/hr)		
		200 VAC to 240 VAC	1,707.9 BTU/hr (1,800 kJ/hr)		

* This is a value measured in compliance with ISO7779.

The M3000 server has been designed to operate while mounted in a natural convection airflow. To meet the environmental specifications, the following requirements must be met:

- The entire server must be supplied with an adequate airflow.

  The M3000 server uses internal fans that can achieve a total airflow of 1.75 cubic meters per minute (61.8 cubic feet per minute [cfm]) under normal operating conditions.

- The server has front-to-back cooling. The air inlet is at the front of the server. The exhaust air exits from the rear of the server.
- Ensure that the temperature at the air inlet of the server does not exceed the upper limit because of additional equipment installed in the equipment rack. The environmental limits assume that the server is operating in the equipment rack with the ventilation panels closed.

3.2.1 Airflow Indicator

The airflow indicator indicates the amount of air emitted from the server while the M3000 server is up and running. To display the value, use the `showenvironment air` command.

CODE EXAMPLE 3-1

```
XSCF> showenvironment air
Air Flow:63CMH
```

The value does not include the peripheral devices.

Note – The `showenvironment air` command displays the calculated airflow based on the fan speed such as Low speed (level -1) or High speed (level -7) etc. The fan speed is displayed by the `showenvironment Fan` command.

For details of the `showenvironment`(8) command, refer to the man page. For installation details of the M3000 server, see the *SPARC Enterprise M3000 Server Installation Guide*.

You can also obtain the exhaust air data using the SNMP agent function. To obtain the data of exhaust air using the SNMP agent function, install the latest XSCF extension MIB definition file to the SNMP manager. For details on the XSCF extension MIB definition file, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

3.3 Power Requirements

This section explains the power requirements of the M3000 server.

3.3.1 Electrical Specifications

This section explains the electrical specifications of the M3000 server.

Note – The electrical power values in TABLE 3-4 are the maximum values based on the fully configured server. The actual values may differ from these values, depending on the server configuration.

TABLE 3-4 Electrical Specifications

	Specification			
Item	**CPU: 2.52 GHz**		**CPU: 2.75 GHz/2.86 GHz**	
Input voltage	100 VAC to 120 VAC	200 VAC to 240 VAC	100 VAC to 120 VAC	200 VAC to 240 VAC
Number of power cords	2 (1 cord for each power supply unit)		2 (1 cord for each power supply unit)	
Power cord length	3 m/9.84 ft		3 m/9.84 ft	
Redundancy	1 + 1 redundant configuration		1 + 1 redundant configuration	
Rated current*	4.80 A	2.59 A	5.15 A	2.81 A
Frequency	50 Hz/60 Hz		50 Hz/60 Hz	
Maximum power consumption	470 W	460 W	505 W	500 W
Apparent power	480 VA	517 VA	515 VA	562 VA
Heat dissipation	1,603.7 BTU/hr (1,692 kJ/hr)	1,569.6 BTU/hr (1,656 kJ/hr)	1,723.1 BTU/hr (1,818 kJ/hr)	1,707.9 BTU/hr (1,800 kJ/hr)
Power factor	0.98	0.89	0.98	0.89
Rush current†	25 A or less		25 A or less	
Leakage current†	1.75 mA or less		1.75 mA or less	

* In a redundant configuration, the rated current per cord is half the value shown in TABLE 3-4.

† This value represents the current for each power cord.

3.3.2 Power Cord Specifications

This section explains power cord specifications of the M3000 server. For details of power cord connections, see the *SPARC Enterprise M3000 Server Installation Guide*.

TABLE 3-5 lists the power cord specifications and connector specifications of the M3000 server.

TABLE 3-5 Power Cords and Connector Specifications

Location	Power Cord Type	Connector Type
Japan	NEMA5-15 125V15A	IEC 60320 C13
North America	NEMAL6-15 250V15A	
China	GB 2099.1 250V15A	
Hong Kong	BS1363 250V15A	
South Korea	IEC60320-C14 250V15A	

Note – For the servers that have the plug with lock function, confirm that a 15A overcurrent protection device is available outside the server. If one is not available, prepare an external 15A overcurrent protection that can be achieved by means of no-fuse breakers (NFBs) or fuses. The plug with lock function refers to plugs other than grounding-type ones with two parallel blades, such as the NEMA L6-30, L6-20, L6-15, and L5-15.

3.3.3 Power Supply Facility

To prevent catastrophic failures, the design of your power system must ensure that sufficient power is provided to the server. Use dedicated distribution panels for all power circuits that supply power to your server. Electrical work and installation must comply with applicable local, state, or national electrical codes.

Qualified equipment racks housing the M3000 servers require their own AC power outlet. To reduce component failure rates, a stable power source is necessary such as an uninterruptible power supply unit (UPS). 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.

Note – If a suitable AC power outlet is not available in your country, ask a qualified electrician to remove the connector from the power cord and connect the power cord to a dedicated branch circuit. For installation requirements, check the local electrical codes.

3.3.4 Grounding

The server must be grounded appropriately.

The M3000 server is shipped with two grounding-type (three-wire) power cords. To appropriately ground the server, make sure to connect the power cords to grounded power outlets.

Contact your facilities manager or a qualified electrician to determine what type of power is supplied to your building.

3.3.5 Power Consumption Monitoring Function

The power consumption monitoring function confirms the amount of power consumed while the M3000 server is up and running.

To display the power consumption, use the `showenvironment power` command.

CODE EXAMPLE 3-2

```
XSCF> showenvironment power
Permitted AC power consumption:470W
Actual AC power consumption:450W
```

Note – The values displayed by the power consumption monitoring function are for reference only. The power consumption value of the server varies by the conditions such as the power supply in use, CPU types, or system configurations, or system load.

For details of the `showenvironment`(8) command, see the man page. For installation details of the M3000 server, see the *SPARC Enterprise M3000 Server Installation Guide*.

You can also obtain the power consumption data using the SNMP agent function. To obtain the power consumption data using the SNMP agent function, install the latest XSCF extension MIB definition file to the SNMP manager. For details on the XSCF extension MIB definition file, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

When there is a change in the power system, such as in the following occurrences, wait for one minute, then check the value again.

- During the server power-on or power-off, or after the power-on or power-off is complete
- During the active replacement of a power supply unit, or after the active replacement is complete

CHAPTER 4

Network Connection

This chapter provides an overview of the network connections required for installing and operating the M3000 server. For details of the network connections, see the *SPARC Enterprise M3000 Server Installation Guide*.

4.1 Setup and Network Connection

The serial port on the rear panel of the server is used for the following purposes:

- Connecting the LAN ports for the eXtended System Control Facility (XSCF) to a system control network
- Monitoring the boot process
- Changing the initial values of the XSCF

A system control network is a secure LAN connecting the XSCF to the management console of the system administrator. This connection can be done directly, but it is usually done through a hub or switch specific to the system control network. The initial settings of the LAN ports are done by directly connecting to the serial port.

4.2 Platform and Domain Setup Information

The following information is required for installation of the M3000 server:

- Host name
- IP address
- Domain
- Net mask
- IP address of the network gateway
- IP address of the network name server

In addition, the following network connections must be available:

- Serial console connection:
  - Baud rate: 9600 bps
  - Data length: 8 bits
  - Parity: None
  - Stop: 1 bit
  - Flow control: None
  - Delay: Except for 0
- Ethernet (10/100BASE-T) connection for the XSCF
- Gigabit Ethernet (GbE)(10/100/1000BASE-T) connection for the domain

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Note – The LAN ports of the XSCF conform to IEEE 802.3i and IEEE 802.3u. For a hub port connection to the LAN of the XSCF, use the auto-negotiation setting.

4.3 Choosing the System Control Network Configuration

In determining the system control network configuration, consider the following:

- The IP address of each LAN port can be assigned in compliance with the existing environment and modified from the default Class B private address.
- The customer may use the dual-power feed or single-power feed option.
- The customer may segregate the LAN port or network for access by field engineers. Otherwise, field engineer access may be through the serial port in the event that maintenance is required.

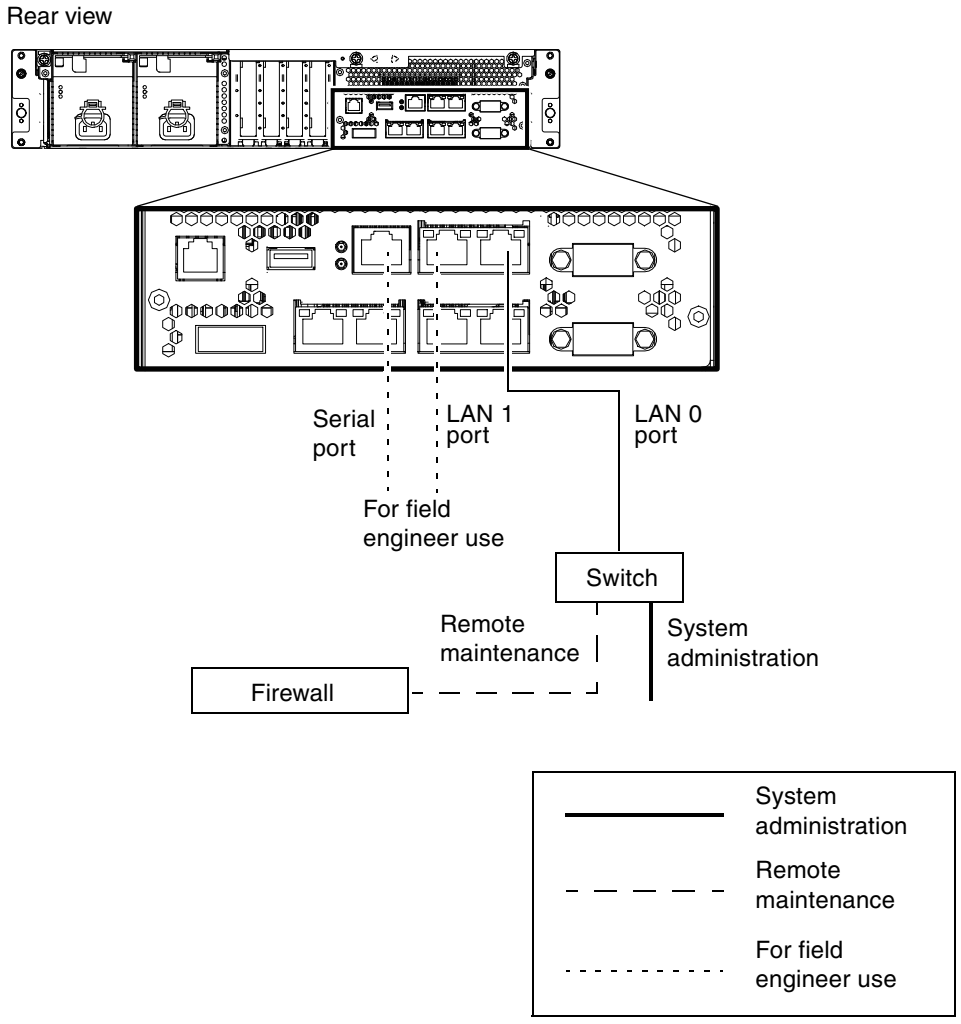
The following are examples of system control network configurations:

- Example 1 - One LAN port is used for administration and remote maintenance.
- Example 2 - Two LAN ports are used separately for administration and remote maintenance.
- Example 3 - Two LAN ports are used to redundantly configure the LAN.

■ **Example 1** - One LAN port is used for administration and remote maintenance.

Only one of the two LAN ports is used for system administration and remote maintenance. A field engineer uses the serial port or the other LAN port. The same switch is used for system administration and remote maintenance, so a switch failure will affect the system control network.

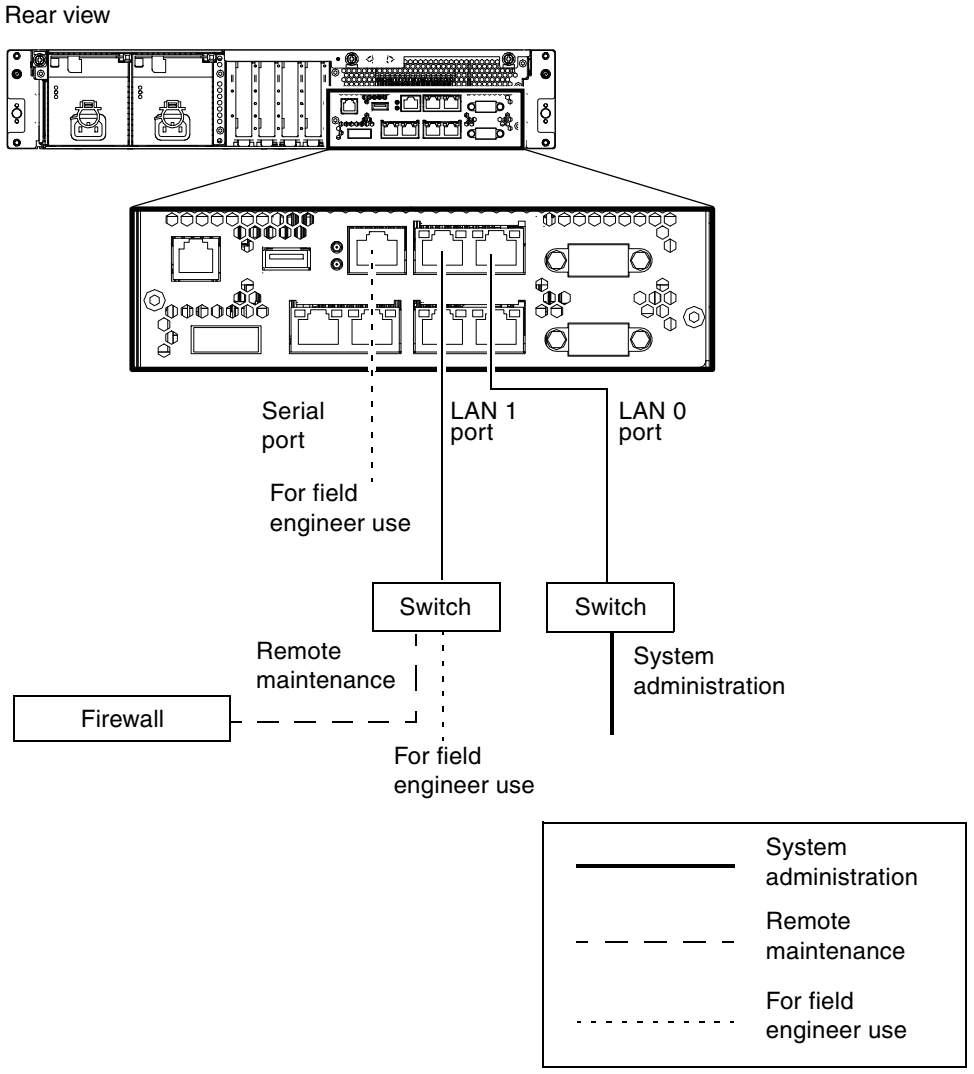
FIGURE 4-1 Example of a Configuration Using Only One LAN Port



- **Example 2** - Two LAN ports are used separately for administration and remote maintenance.

The two LAN ports are both used. One port is used for system administration, and the other is used for remote maintenance. Even if one switch fails, errors can still be reported. A field engineer uses the serial port or a port on the switch for remote maintenance.

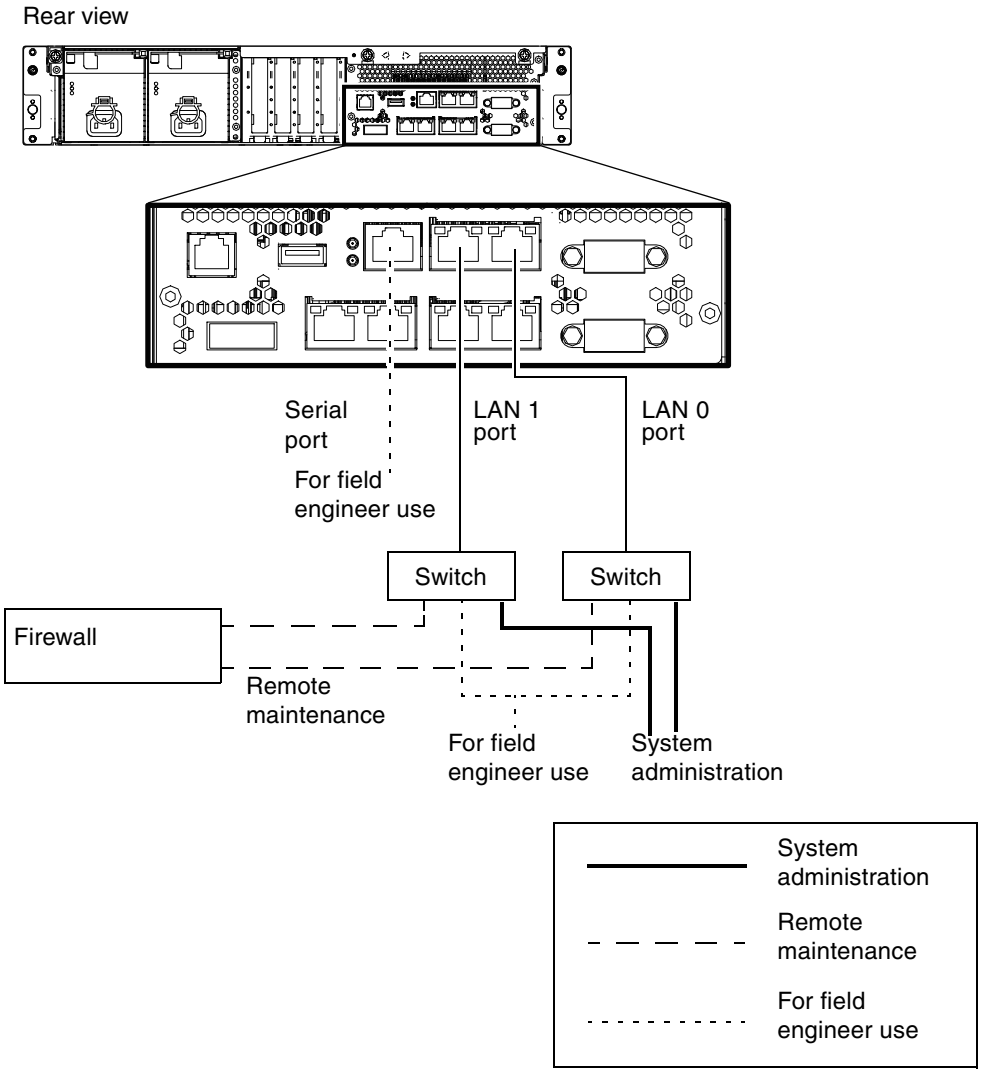
FIGURE 4-2 Example of a Configuration Using the Two LAN Ports



■ **Example 3** - Two LAN ports are used to redundantly configure the LAN.

The two LAN ports are both used. Both ports are used for system administration and remote maintenance. A field engineer uses the serial port or the two LAN ports. If one of the LAN ports or the switches fails, the other LAN is used, so the system control network is not affected.

FIGURE 4-3 Example of a Configuration Using the Two LAN Ports to Redundantly Configure the LAN



For more information on connecting to a console, see the *SPARC Enterprise M3000 Server Installation Guide*.

APPENDIX **A**

UPS Controller

This appendix explains the UPS controller (UPC), which controls an uninterruptible power supply unit (UPS).

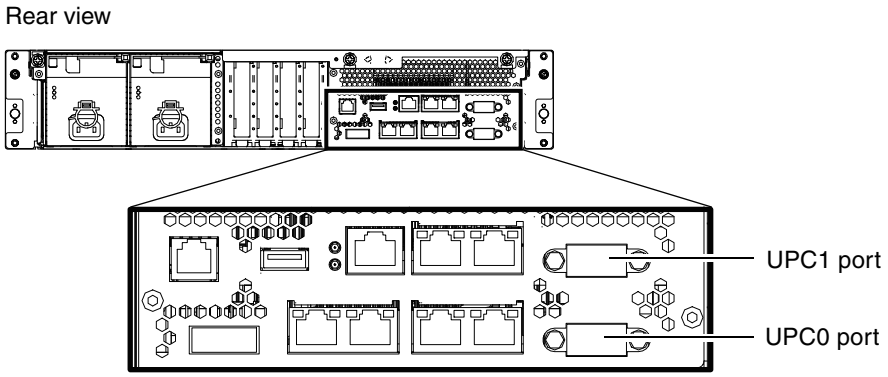
A.1 Overview

A UPS unit is used to provide a stable supply of power to the system in the event of a power failure or an extensive power interruption.

When a failure is detected in the supply of power, an error can be reported to the server through the signal cable connection between a UPC port on the server and a UPS that has the UPC interface. Then the server can execute emergency shutdown processing to safely shut down the system.

FIGURE A-1 shows the locations of the UPC ports on the M3000 server.

FIGURE A-1 UPC Port Locations



A.2 Signal Cables

Prepare shielded and paired cables that have the following specifications:

- DC resistance (roundtrip/1 pair): 400 Ω/km or less
- Cable length: Up to 10 m (33 ft.)

A.3 Signal Line Configuration

This section describes signal line configuration and definitions when connected to a UPS.

FIGURE A-2 shows the signal line configuration when connected to a UPS.

FIGURE A-2 Connection With UPS and the Server

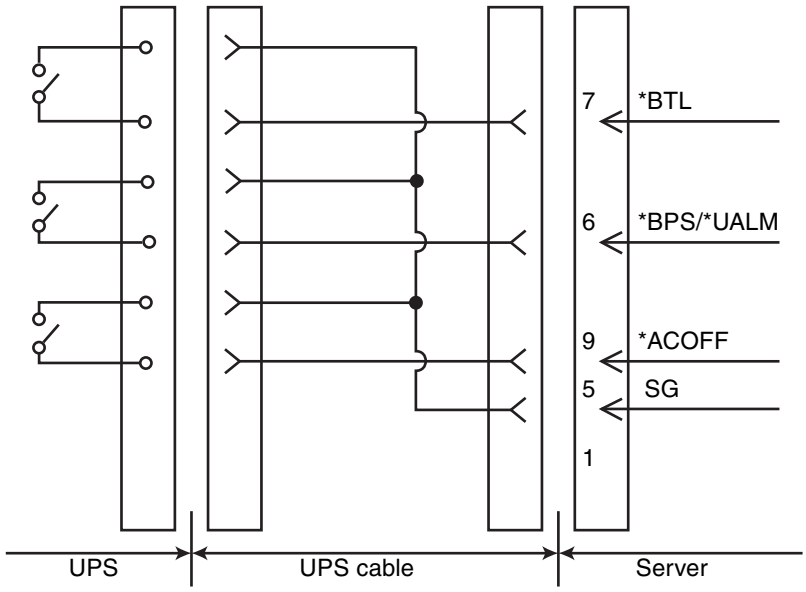


TABLE A-1 Signal Definitions

Signal Name	Definitions	Pin Number	Remarks
*BPS/*UALM	Signal indicates faulty UPS conditions.	6	Normal: OFF Failure: ON
*BTL	Signal provides a warning of a low battery level and a pending UPS failure.	7	Normal: OFF Warning: ON (Note1)
*ACOFF	Signal indicates power failure at the commercial AC supply connector to the UPS.	9	Normal: OFF Power failure: ON (Note2)
SG	Signal ground	5	
ER	Signal indicates the main unit is running (Equipment Ready).	1	Do not connect to ER signal pin.

ON: Indicates that the contact is closed.

OFF: Indicates that the contact is open.

Note 1: Use a UPS that can normally supply power from the battery at least 10 to 60 seconds after *BTL is turned on.

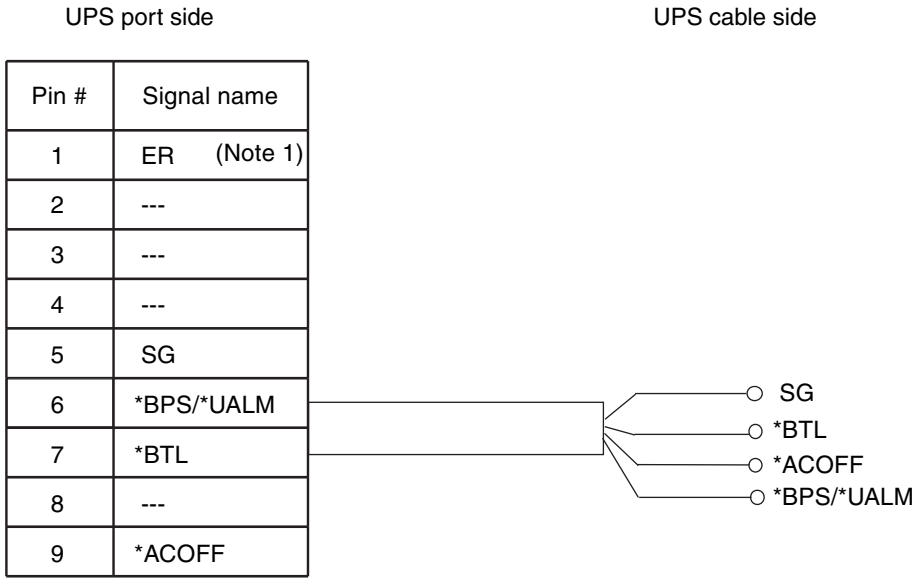
Note 2: Use a UPS that can supply power normally from its battery even if *ACOFF does not turn on in the event of an instantaneous power failure lasting two seconds or less.

A.4 Cable Connector

The UPS cable has the following specifications:

- Connector type
  D-SUB9 pin Male (install side: Female)
  DEU-9PF-F0
- Terminal array
  FIGURE A-3 identifies pin signals of the UPC port and the UPS cable.
  Do not use the unused pins (pin number 2, 3, 4 and 8 in the following diagram).
  Cable side shown below.

FIGURE A-3 Correspondence Between the UPC Ports and the UPS Cable Pins



Note 1: Do not connect to ER signal pin.

Note – If you need UPS cables, you need to make arrangements separately. For details, contact your sales representatives.

APPENDIX **B**

DC Power Supply Model

This appendix explains specifications and requirements specific to the DC power supply model.

Contact your sales representative for the DC power supply model.

To use the DC power supply model, make sure to read this information.

- Section B.1, "Server Installation Guidelines" on page B-1

  This is equivalent to Section 2.2, "Server Installation Guidelines" on page 2-3. When using the DC power supply model, refer to the content described in this appendix.

- Section B.2, "Cooling Specifications" on page B-2

  This is equivalent to Section 3.2, "Cooling Specifications" on page 3-4. When using the DC power supply model, refer to the content described in this appendix. However, the Section 3.2.1, "Airflow Indicator" on page 3-5 is common to AC power supply model and DC power supply model.

- Section B.3, "Power Requirements" on page B-4

  This is equivalent to Section 3.3, "Power Requirements" on page 3-6. When using the DC power supply model, refer to the content described in this appendix.

Note – The content not mentioned in this appendix is common to the AC power supply model and the DC power supply model. Refer to the description in each chapter.

B.1 Server Installation Guidelines

This section explains the installation guidelines for the DC power supply model.

Note – This is equivalent to Section 2.2, "Server Installation Guidelines" on page 2-3. When using the DC power supply model, refer to the content described in this appendix.

As you plan the installation of the DC power supply model, keep the following conditions in mind:

- Each server requires two power cords. Each power cord must be connected to a separate input power source. When using the dual power feed option, the power cords must be connected to separate power supply facilities.
- The power supply facility must meet the relevant electrical codes.
- Install the DC power supply model in a location where you can restrict access to the area. A location where you can restrict access to the area refers to a place provided with some way of lock-up mechanism such as keys or the locks using the access cards.

For details of the server installation, see the *SPARC Enterprise M3000 Server Installation Guide*.

B.2 Cooling Specifications

This section explains the cooling conditions for the DC power supply model.

Note – This is equivalent to Section 3.2, "Cooling Specifications" on page 3-4. When using the DC power supply model, refer to the content described in this appendix.

In installing the server, note the following conditions:

- The room should have an adequate air-conditioning system that meets the cooling requirements of the entire server.
- The air-conditioning system should have controls that prevent excessive temperature changes.

TABLE B-1 shows the cooling specifications of the fully configured M3000 server.

TABLE B-1 Cooling Specifications

Configuration	CPU	Input Voltage	Maximum Heat Dissipation	Maximum Exhaust Airflow	Noise Level*
1 CPU, 64 GB memory	CPU:2.75 GHz	-48 Vdc	1,723.1 BTU/hr (1,818 kJ/hr)	1.75 m^3/min	47 dB
		-60 Vdc	1,740.2 BTU/hr (1,836 kJ/hr)		
	CPU:2.86 GHz	-48 Vdc	1,723.1 BTU/hr (1,818 kJ/hr)		
		-60 Vdc	1,740.2 BTU/hr (1,836 kJ/hr)		

* This is a value measured in compliance with ISO7779.

The M3000 server has been designed to operate while mounted in a natural convection airflow. To meet the environmental specifications, the following requirements must be met:

- The entire server must be supplied with an adequate airflow.

  The M3000 server uses internal fans that can achieve a total airflow of 1.75 cubic meters per minute (61.8 cubic feet per minute [cfm]) under normal operating conditions.

- The server has front-to-back cooling. The air inlet is at the front of the server. The exhaust air exits from the rear of the server.
- Ensure that the temperature at the air inlet of the server does not exceed the upper limit because of additional equipment installed in the equipment rack. The environmental limits assume that the server is operating in the equipment rack with the ventilation panels closed.

B.3 Power Requirements

This section explains the power requirements for the DC power supply model.

Note – This is equivalent to Section 3.3, "Power Requirements" on page 3-6. When using the DC power supply model, refer to the content described in this appendix.

B.3.1 Electrical Specifications

This section explains the electrical specifications of the DC power supply model.

Note – The electrical power values in TABLE B-2 are the maximum values based on the fully configured server. The actual values may differ from these values, depending on the server configuration.

TABLE B-2 Electrical Specifications

	Specification	
Item	**CPU: 2.75 GHz/2.86 GHz**	
Input voltage	-48 Vdc	-60 Vdc
Number of power cords	2 (1 cord for each power supply unit)	
Power cord length	5 m/16.4 ft	
Redundancy	1 + 1 redundant configuration	
Rated current*	10.52 A	8.50 A
Frequency	-	-
Maximum power consumption	505 W	510 W
Apparent power	-	-
Heat dissipation	1,723.1 BTU/hr (1,818 kJ/hr)	1,740.2 BTU/hr (1,836 kJ/hr)
Power factor	-	-

* In a redundant configuration, the rated current per cord is half the value shown in TABLE B-2.

B.3.2 Power Cord Specifications

This section explains power cord specifications of the DC power supply model. For details of power cord connections, see the *SPARC Enterprise M3000 Server Installation Guide*.

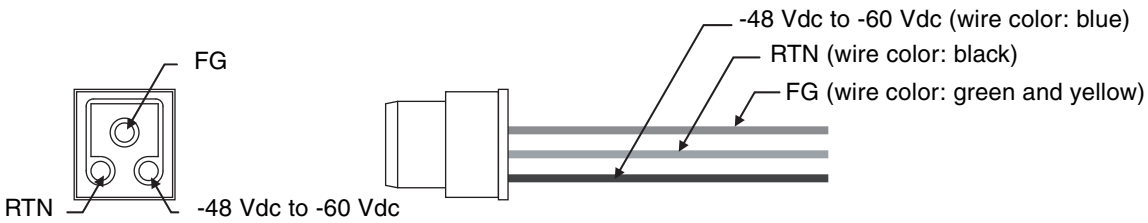
TABLE B-3 lists the power cord specifications of the DC power supply model.

TABLE B-3 Power Cords and Connector Specifications

Item	Specification
Connector	294-0085-00100A of ELCON
Cord structure	Three AWG 14 wires
Cord length	5 m

FIGURE B-1 shows the structure of the DC power cord.

FIGURE B-1 Structure of DC Power Cord



The DC power cord supplied with the server has a connector only for the server end. Therefore, a terminal matching the DC power supply facility will need to be attached to the DC power supply end of the cord.

To prevent signal attenuation, a voltage drop caused by conductor impedance must be suppressed down to less than 2 % of the reference voltage. If the voltage of the DC power supply facility is other than the above voltage, use a cord length that ensures that the voltage drop is suppressed to 2 % or less.

For the allowable cord length (each for -48 Vdc and -60 Vdc) between the DC power supply facility and the server, contact your service engineer.

B.3.3 Power Supply Facility

To prevent catastrophic failures, the design of your power system must ensure that sufficient power is provided to the server. Use dedicated distribution panels for all power circuits that supply power to your server. Electrical work and installation must comply with applicable local, state, or national electrical codes.

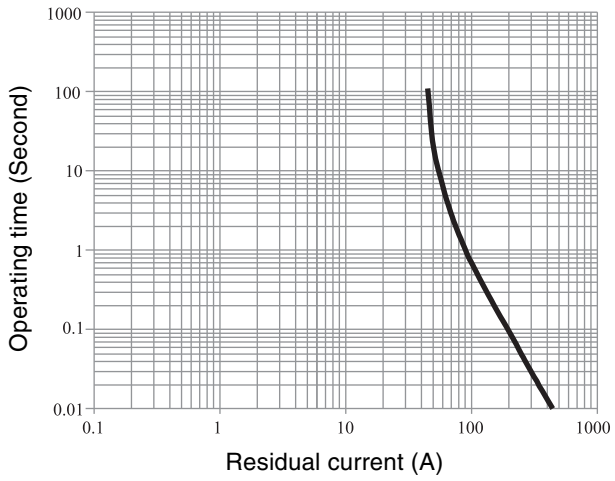
Observe the following precautions, when mounting the DC power supply model in the qualified equipment rack.

- Always mount overcurrent protective devices between the server and DC power supply facility. One overcurrent protective device is required for each power supply line. The overcurrent protective devices must comply with the following specifications:
  - Current rating: 30 A
  - Voltage rating: 65 Vdc or more
  - Operation type: Immediate shutdown type (however, overcurrent protective devices should not operate against 1 ms rush currents with a peak current of 100 A)
  - Number of poles: 2 (-48 Vdc to -60 Vdc line and RTN line)
- The power supply that can be used with the M3000 server is restricted to DC power supply facility that is separate from the AC power, or DC power supply facility that has double or reinforced insulation for high, dangerous voltages.
- The DC power supply facilities must be capable of continuously supplying the following capacity to each of the power cords.
  - Power requirements: 510 W

When attaching an overcurrent protective device, consider protective coordination with the fuse provided in the server. Attach an overcurrent protective device that has slower cutoff characteristics than the fuse in the server.

FIGURE B-2 shows the cutoff characteristics of the fuse provided in the server.

FIGURE B-2 Cutoff Characteristics of Overcurrent Protective Device



B.3.4 Grounding

The server must be grounded appropriately.

The DC power supply model of the M3000 server is shipped with two DC power cords. Since these DC power cords have a connector only for the server end, a terminal matching the DC power supply facility will need to be attached to the DC power supply end of the cord. Moreover, the power supply facility must be correctly grounded. Confirm that the grounding prong is connected to the positive bus on the battery box.

The grounding resistance must not be greater than 10 Ω. Make sure that the facility administrator or a qualified electrician verifies the grounding method for the building and performs the grounding work.

B.3.5 Power Consumption Monitoring Function

The power consumption monitoring function confirms the amount of power consumed while the M3000 server is up and running.

To display the power consumption, use the `showenvironment power` command.

```
XSCF> showenvironment power
Permitted DC power consumption:470W
Actual DC power consumption:450W
```

Note – The values displayed by the power consumption monitoring function are for reference only. The power consumption value of the server varies by the conditions such as the power supply in use, CPU types, or system configurations, or system load.

For details of the `showenvironment`(8) command, see the man page. For installation details of the SPARC Enterprise M3000 server from Oracle and Fujitsu, see the *SPARC Enterprise M3000 Server Installation Guide*.

You can also obtain the power consumption data using the SNMP agent function. To obtain the power consumption data using the SNMP agent function, install the latest XSCF extension MIB definition file to the SNMP manager. For details on the XSCF extension MIB definition file, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

When there is a change in the power system, such as in the following occurrences, wait for one minute, then check the value again.

- During the server power-on or power-off, or after the power-on or power-off is complete
- During the active replacement of a power supply unit, or after the active replacement is complete

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