

Sun SPARC Enterprise T5120 and T5220 Servers

Site Planning Guide



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Using This Documentation

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- "UNIX Commands" on page vii
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UNIX Commands

This document might not contain information on basic UNIX commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Oracle Solaris Operating System documentation, which is at:
(<http://docs.sun.com>)

Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

The documents listed as online are available at:

<http://docs.sun.com/app/docs/prod/sparc.t5120>

<http://docs.sun.com/app/docs/prod/sparc.t5220>

Application	Title	Part Number	Format	Location
Product Notes	<i>Sun SPARC Enterprise T5120 and T5220 Servers Product Notes</i>	820-2176	PDF	Online
Getting Started	<i>Sun SPARC Enterprise T5120 Server Getting Started Guide</i>	820-4417	Printed	Ships with system
Getting Started	<i>Sun SPARC Enterprise T5120 Server Getting Started Guide (DC)</i>	820-5838	Printed	Ships with system
Getting Started	<i>Sun SPARC Enterprise T5220 Server Getting Started Guide</i>	820-4418	Printed	Ships with system
Getting Started	<i>Sun SPARC Enterprise T5220 Server Getting Started Guide (DC)</i>	820-5839	Printed	Ships with system
Planning	<i>Sun SPARC Enterprise T5120 and T5220 Servers Site Planning Guide</i>	820-2177	PDF HTML	Online
Installation	<i>Sun SPARC Enterprise T5120 and T5220 Servers Installation Guide</i>	820-2178	PDF HTML	Online
Administration	<i>Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide</i>	820-2179	PDF HTML	Online

Application	Title	Part Number	Format	Location
Service	<i>Sun SPARC Enterprise T5120 and T5220 Servers Service Manual</i>	820-2181	PDF HTML	Online
Safety	<i>Sun SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Manual</i>	820-2182	PDF	Online
Remote Management	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun SPARC Enterprise T5120 and T5220 Servers</i>	820-6683	PDF HTML	Online
Remote Management	<i>Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun SPARC Enterprise T5120 and T5220 Servers</i>	820-2180	PDF HTML	Online

Documentation, Support, and Training

These web sites provide additional resources:

- Documentation (<http://docs.sun.com>)
- Support (<http://www.sun.com/support>)
- Training (<http://www.sun.com/training>)

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SPARC Enterprise T5120 and T5220 Servers Site Planning Guide, part number 820-2177-14.

Sun SPARC Enterprise T5120 and T5220 Servers Site Planning Guide

This guide provides specifications and site planning requirements for the Sun SPARC Enterprise T5120 and T5220 servers.

For safety and regulatory compliance information, refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide* and the documentation that came with your server.

This guide contains the following sections.

- “Physical Specifications” on page 2
- “Minimum Clearance for Service Access” on page 3
- “Environmental Specifications” on page 4
- “Power Source Requirements” on page 5
- “Acoustic Noise Emissions” on page 8
- “Agency Compliance Specifications” on page 9
- “Operating Environment Requirements” on page 9
- “Electrical Power” on page 10
- “Ambient Temperature” on page 10
- “Ambient Relative Humidity” on page 10
- “Airflow Considerations” on page 11

Physical Specifications

TABLE: Sun SPARC Enterprise T5120 Server Physical Specifications

Description	U.S.	Metric
Width	16.75 in.	425 mm
Depth	28.125 in.	714 mm
Height	1.746 in.	44 mm
Weight, approximate (without PCI cards and rackmounts)	40 lb	18 kg

TABLE: Sun SPARC Enterprise T5220 Server Physical Specifications

Measure	U.S.	Metric
Width	16.75 in.	425 mm
Depth	28.125 in.	714 mm
Height (2 rack units)	3.49 in.	88 mm
Weight, approximate (without PCI cards and rackmounts)	55 lb	25 kg

Related Information

- [“Minimum Clearance for Service Access” on page 3](#)

Minimum Clearance for Service Access

TABLE: Minimum Clearances Needed for Service for Both Servers

Description	Clearance
Clearance, front of system	36 in. (91 cm)
Clearance, rear of system	36 in. (91 cm)

Related Information

- [“Environmental Specifications”](#) on page 4

Environmental Specifications

TABLE: Environmental Specifications for Both Servers

Specification	Operating	Nonoperating
Temperature	<ul style="list-style-type: none"> Sea level to 2953 ft (900m): 41°F to 95°F (5°C to 35°C) 	-40° F to 149° F (-40°C to 65°C)
	<ul style="list-style-type: none"> Above 2953 ft (900m): Decrease the maximum allowable temperature by 1.6°F/1000 ft (1°C/300m) 	IEC 60068-2-1 Test Ab and 60068-2-2 Test Bb
	IEC 60068-2-1 Test Ad, and 60068-2-2 Test Bd	
Relative Humidity	10 to 90% RH, 27°C maximum wet bulb (noncondensing)	93% RH, 35°C maximum wet bulb (noncondensing)
	IEC 60068-2-56 Test Cb	IEC 60068-2-56 Test Cb
Altitude	10,000 ft (3,000m)	40,000 ft (12,000m)
Vibration	IEC 60068-2-13 Test M, and 60068-2-41 Test Z/BM	IEC 60068-2-13 Test M
	0.15 G (z-axis), 0.10 G (x-, y-axes), 5-500Hz swept sine	0.5 G (z-axis), 0.25 G (x-, y-axes), 5-500Hz swept sine
	IEC 60068-2-6 Test Fc	IEC 60068-2-6 Test Fc
Shock	3 Gs, 11 ms half-sine	<ul style="list-style-type: none"> Roll-off: 1-inch roll-off free fall, front to back rolling directions
	IEC 60068-2-27 Test Ea	<ul style="list-style-type: none"> Threshold: 25 mm threshold height at 0.75 m/s impact velocity
		ETE-1010-02 Rev A

Related Information

- [“Power Source Requirements” on page 5](#)

Power Source Requirements

Both the Sun SPARC Enterprise T5120 and T5220 servers from Oracle have two autoranging power supplies. To ensure redundant operation of the power supplies, connect the two power cords to separate circuits.

Server models that run on DC input power require that you build power cables and connect to DC input power as specified in the *Sun SPARC Enterprise T5120 and T5220 Server Installation Guide*.

Use the specifications only as a planning guide. For more precise power values, make power measurements on your specific server configuration using your planned workload. Refer to one of the following tables based on the model of your server.

TABLE: Sun SPARC Enterprise T5120 Server (4-Disk Capable) Power Specifications

General Specifications	AC Input Models	DC Input Models
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz	-48 to -60 VDC
Maximum operating input current	At 100 VAC: 7.0 A	At -48 VDC: 15.4 A
Maximum operating input current	At 200 VAC: 3.5 A	
Maximum operating input power	At 100 VAC: 660.3 W	At -48 VDC: 616.8 W
Maximum heat dissipation	2253.0 BTU/hour (2377.1 KJ/hour)	2104.5 BTU/hour (2220.3 KJ/hour)
Maximum standby power	9.2 W	8.6 W
Maximum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (8 core, 1.6 GHz processor, with sixteen 4 GB FBDIMMs, 4 HDDs, 3 PCIe I/O cards)		
Idle input power	381.5 W	356.4 W
Peak input power running SpecJBB	615.3 W	574.7 W
Minimum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (4 core, 1.2 GHz processor, with four 1 GB FBDIMMs, no HDDs, no PCIe I/O cards)		
Idle input power	187.0 W	174.7 W
Peak input power running SpecJBB	200.0 W	186.8 W

TABLE: Sun SPARC Enterprise T5120 Server (8-Disk Capable) Power Specifications

General Specifications	AC Input Models	DC Input Models
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz	-48 to -60 VDC
Maximum operating input current	At 100 VAC: 7.3 A	At -48 VDC: 16.3 A
Maximum operating input current	At 200 VAC: 3.7 A	
Maximum operating input power	At 100 VAC: 697.4 W	At -48 VDC: 651.4 W
Maximum heat dissipation	2379.5 BTU/hour (2510.5 KJ/hour)	2222.6 BTU/hour (2344.9 KJ/hour)
Maximum standby power	9.2 W	8.6 W
Maximum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (8 core, 1.4 GHz processor, with sixteen 4 GB FBDIMMs, 8 HDDs, 3 PCIe I/O cards)		
Idle input power	419.2 W	391.5 W
Peak input power running SpecJBB	662.4 W	618.7 W
Minimum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (4 core, 1.2 GHz processor, with four 1 GB FBDIMMs, no HDDs, no PCIe I/O cards)		
Idle input power	187.0 W	174.7 W
Peak input power running SpecJBB	200.0 W	186.8 W

TABLE: Sun SPARC Enterprise T5220 Server (8-Disk Capable) Power Specifications

General Specifications	AC Input Models	DC Input Models
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz	-48 to -60 VDC
Maximum operating input current	At 100 VAC: 8.9 A	At -48 VDC: 19.7 A
Maximum operating input current	At 200 VAC: 4.4 A	
Maximum operating input power	At 100 VAC: 844.4 W	At -48 VDC: 788.7 W
Maximum heat dissipation	2881.1 BTU/hour (3039.7 KJ/hour)	2691.1 BTU/hour (2839.3 KJ/hour)
Maximum standby power	10.1 W	9.4 W

TABLE: Sun SPARC Enterprise T5220 Server (8-Disk Capable) Power Specifications

Maximum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (8 core, 1.6 GHz processor, with sixteen 4 GB FBDIMMs, 8 HDDs, 6 PCIe I/O cards)		
Idle input power	471.5 W	440.4 W
Peak input power running SpecJBB	807.4 W	754.1 W
Minimum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (4 core, 1.2 GHz processor, with four 1 GB FBDIMMs, no HDDs, no PCIe I/O cards)		
Idle input power	194.0 W	181.2 W
Peak input power running SpecJBB	220.0 W	205.5 W

TABLE: Sun SPARC Enterprise T5220 Server (16-Disk Capable) Power Specifications

General Specifications	AC Input Models	DC Input Models
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz	-48 to -60 VDC
Maximum operating input current	At 100 VAC: 9.9 A	At -48 VDC: 21.9 A
Maximum operating input current	At 200 VAC: 4.9 A	
Maximum operating input power	At 100 VAC: 938.5 W	At -48 VDC: 876.6 W
Maximum heat dissipation	3202.2 BTU/hour (3378.5 KJ/hour)	2991.1 BTU/hour (3155.7 KJ/hour)
Maximum standby power	10.1 W	9.4 W
Maximum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (8 core, 1.6 GHz processor, with sixteen 4 GB FBDIMMs, 16 HDDs, 6 PCIe I/O cards)		
Idle input power	546.8 W	510.7 W
Peak input power running SpecJBB	901.5 W	842.0 W
Minimum Server Configuration Specifications		
Under Nominal Temperature and Voltage Conditions (4 core, 1.2 GHz processor, with four 1 GB FBDIMMs, no HDDs, no PCIe I/O cards)		
Idle input power	194.0 W	181.2 W
Peak input power running SpecJBB	220.0 W	205.5 W

Note – The maximum operating input current values are based on $P / (V * 0.95)$, where P=maximum operating input power, V=input voltage. Example: $662 / (110 * 0.95) = 6.33$ A at 110 VAC. You can use this equation to calculate the maximum operating input current for your specific input voltage.

Related Information

- [“Acoustic Noise Emissions” on page 8](#)

Acoustic Noise Emissions

Declared noise emissions for both the SPARC Enterprise T5120 and T5220 servers are in accordance with ISO 9296 standards.

TABLE: Acoustic Noise Emissions for the SPARC Enterprise T5120 Server

Description	Mode	Specification
LwAd (1 B = 10 dB)	Operating acoustic noise	7.0 B
	Idling acoustic noise	7.0 B
LpAm (bystander positions)	Operating acoustic noise	59 dB
	Idling acoustic noise	59 dB

TABLE: Acoustic Noise Emissions for the SPARC Enterprise T5220 Server

Description	Mode	Specification
LwAd (1 B = 10 dB)	Operating acoustic noise	7.4 B
	Idling acoustic noise	7.4 B
LpAm (bystander positions)	Operating acoustic noise	63 dB
	Idling acoustic noise	63 dB

Related Information

- [“Agency Compliance Specifications” on page 9](#)

Agency Compliance Specifications

Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide* for a full list of agency compliance specifications.

Related Information

- [“Operating Environment Requirements” on page 9](#)

Operating Environment Requirements

The operating environment requirements are the same for both the SPARC Enterprise T5120 and T5220 servers. Your environmental control system must provide intake air for the servers that complies with the limits specified in [“Environmental Specifications” on page 4](#).

To avoid overheating, *do not* direct warmed air:

- Toward the front air intake of the server
- Toward the server access panels

Note – When you receive your server, place it in the environment where you will install it. Leave it in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.

The servers have been tested to meet all functional requirements when operating in the operating environmental limits presented [“Environmental Specifications” on page 4](#). Operating computer equipment in extremes of temperature or humidity increases the failure rate of hardware components. To minimize the chance of component failure, use the server within the optimal temperature and humidity ranges.

Related Information

- [“Electrical Power” on page 10](#)

Electrical Power

Good practice is to connect each power supply to a separate circuit. This redundancy enables the system to remain operational if one of the circuits fails. Consult your local electrical codes for any additional requirements.

Related Information

- [“Ambient Temperature” on page 10](#)

Ambient Temperature

An ambient temperature range of 21°C (69.8°F) to 23°C (73.4°F) is optimal for server reliability. At 22°C (71.6°F) it is easy to maintain safe relative humidity levels. Operating in this temperature range provides a buffer if the environmental support systems fail.

Related Information

- [“Ambient Relative Humidity” on page 10](#)

Ambient Relative Humidity

Ambient relative humidity levels between 45% and 50% are the most suitable for data processing operations in order to:

- Prevent corrosion
- Provide an operating time buffer in the event of environmental control system failure
- Help avoid failures caused by the intermittent interference from static discharges that occur when relative humidity is too low

Electrostatic discharge (ESD) is easily generated and less easily dissipated in areas where the relative humidity is below 35%, and becomes critical when levels drop below 30%.

Related Information

- “Ambient Relative Humidity” on page 10

Airflow Considerations

- Ensure unobstructed airflow through the chassis.
- Ensure that inlet air enters at the front of the server and exits from the back.
- Ensure that the server ventilation openings used for intake and outflow of air provide an open area that is at least 60% of the open area perforations across the front and rear of the server. This 60% minimum open area equates to the following dimensions, depending on the server model:

Minimum Open Area	Metric Units	US Units
SPARC Enterprise T5120 Server	112.2 cm ² (425 mm x 44 mm)	17.4 in ² (16.7 in x 1.7 in)
SPARC Enterprise T5220 Server	224.4 cm ² (425 mm x 88 mm)	34.8 in ² (16.7 in x 3.5 in)

- Allow a minimum of 5 mm (0.2 in) clearance at the front of the system and 80 mm (3.1 in) at the rear of the server when mounted. These clearance values are based on the preceding inlet and exhaust impedance (available open area) and assume a uniform distribution of the open area across the inlet and exhaust areas. Clearance values greater than these are recommended for improved cooling performance.

Note – The combination of inlet and exhaust restrictions such as cabinet doors and the spacing of the server from the doors can affect the cooling performance of the server and should be evaluated by the user.

- Take care to prevent recirculation of exhaust air within a rack or cabinet.
- Manage cables to minimize interfering with the server exhaust vent.

Related Information

- [Sun SPARC Enterprise T5120 and T5220 Servers Documentation](#)
- *Sun SPARC Enterprise T5120 Server Getting Started Guide*
- *Sun SPARC Enterprise T5220 Server Getting Started Guide*
- *Sun SPARC Enterprise T5120 Server Getting Started Guide (DC)*
- *Sun SPARC Enterprise T5220 Server Getting Started Guide (DC)*

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