

# Sun SPARC Enterprise T5440 Server

## Site Planning Guide



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# SPARC Enterprise T5440 Site Planning Guide

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This guide provides Oracle's Sun SPARC Enterprise T5440 server specifications and site requirements that you can use to plan and prepare your site.

For safety and compliance information, refer to the *Sun SPARC Enterprise T5440 Server 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 2
- "Environmental Specifications" on page 3
- "Power Source Requirements" on page 4
- "Calculating Maximum Input Current" on page 5
- "Acoustic Noise Emissions" on page 6
- "Agency Compliance Specifications" on page 6
- "Operating Environment Requirements" on page 6

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# Physical Specifications

**TABLE:** Physical Specifications for the SPARC Enterprise T5440 Server

Description	U.S.	Metric
Width	17.5 in.	445 mm
Depth	24.9 in.	633 mm
Height	6.92 in. (4U)	176 mm
Weight, approximate (without PCI cards and rackmounts)	88 lb	40 kg

## Related Information

- [“Minimum Clearance for Service Access” on page 2](#)
- [“Environmental Specifications” on page 3](#)
- [“Power Source Requirements” on page 4](#)

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# Minimum Clearance for Service Access

**TABLE:** Minimum Needed Clearances

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

## Related Information

- [“Physical Specifications” on page 2](#)
- *Sun SPARC Enterprise T5440 Server Installation Guide*
- *Sun SPARC Enterprise T5440 Server Service Manual*

# Environmental Specifications

**TABLE:** Environmental Specifications for the SPARC Enterprise T5440 Server

Specification	Operating	Nonoperating
<b>Temperature</b>	<ul style="list-style-type: none"> <li>Sea level to 2953 ft. (900m): 41°F to 95°F (5°C to 35°C)</li> </ul>	-40°F to 149°F (-40°C to 65°C)
	<ul style="list-style-type: none"> <li>Above 2953 ft. (900m): Decrease the maximum allowable temperature by 1.6°F/1000 ft (1°C/300m)</li> </ul>	IEC 60068-2-1 Test Ab and 60068-2-2 Test Bb
	IEC 60068-2-1 Test Ad, and 60068-2-2 Test Bd	
<b>Relative Humidity</b>	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
<b>Altitude</b>	10,000 ft. (3,000m)	40,000 ft. (12,000m)
	IEC 60068-2-13 Test M, and 60068-2-41 Test Z/BM	IEC 60068-2-13 Test M
<b>Vibration</b>	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
<b>Shock</b>	3 Gs, 11 ms half-sine	<ul style="list-style-type: none"> <li>Roll-off: 1-inch roll-off free fall, front to back rolling directions</li> </ul>
	IEC 60068-2-27 Test Ea	<ul style="list-style-type: none"> <li>Threshold: 25 mm threshold height at 0.75 m/s impact velocity</li> </ul>

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## Related Information

- [“Physical Specifications” on page 2](#)
- [“Power Source Requirements” on page 4](#)



# Power Source Requirements

The SPARC Enterprise T5440 server has four autoranging power supplies. To ensure redundant operation of the power supplies, connect the power cords to at least two separate AC circuits.

Use the specifications in [TABLE: SPARC Enterprise T5440 Power Specifications on page 4](#) only as a planning guide. For more precise power values, make power measurements on your specific server configuration using your planned workload.

**TABLE:** SPARC Enterprise T5440 Power Specifications

Description	Specification
<b>General Specifications</b>	
Operating input voltage range	100 - 240 VAC, 50 - 60 Hz (VAC tolerance +/- 10%)
Maximum operating input current at 100 VAC*	27.00 A
Maximum operating input current at 200 VAC	13.25 A
Maximum operating input power at 100 VAC	2700 W
Maximum heat dissipation	9212.8 BTU/hour or 9720 KJ/hour
Maximum standby power	70 W
<b>Maximum Server Configuration Specifications</b>	
Under Nominal Temperature and Voltage Conditions 4 CMP, 1.6 GHz, 32 cores (8 cores each), 64 x 4 GByte 800mhz FB-DIMMs, 4 HDDs, 8 PCIe cards	
Idle AC input power	1671 W
Peak AC input power running SpecJBB	2213 W
<b>Minimum Server Configuration Specifications</b>	
Under Nominal Temperature and Voltage Conditions 2 CMP, 1.2 GHz, 16 cores (8 cores each), 8 x 2 GByte FB-DIMMs, no HDDs, no I/O cards	
Idle AC input power	495 W
Peak AC input power running SpecJBB	590 W

\* See [TABLE: Maximum Operating Input Current Calculations on page 5](#)

## Related Information

- [“Environmental Specifications” on page 3](#)
- [“Calculating Maximum Input Current” on page 5](#)
- [“Electrical Power” on page 7](#)
- *Sun SPARC Enterprise T5440 Server Service Manual*

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# Calculating Maximum Input Current

The maximum operating current values are based on P/V using the equations in [TABLE: Maximum Operating Input Current Calculations on page 5](#).

**TABLE:** Maximum Operating Input Current Calculations

Range	Equation	Example
[90-120 V]	$P = 3316 - 6.87 * V$	I = 22.0 A @ 115V, or 11.0 A per line cord with two power supplies active.
[200-240 V]	$P = 2447 + 0.375 * V$	I = 12.0 A @ 210V, or 6.0 A per line cord with two power supplies active.

## Related Information

- [“Power Source Requirements” on page 4](#)

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# Acoustic Noise Emissions

Declared noise emissions for the SPARC Enterprise T5440 server is in accordance with ISO 9296 standards. See [TABLE: SPARC Enterprise T5440 Noise Emissions on page 6](#).

**TABLE:** SPARC Enterprise T5440 Noise Emissions

Description	Operating at idle	Operating at maximum power
Sound power level, LwAd (1 B = 10 dB)	7.4 B	8.9 B
Sound Pressure Level, LpAm (bystander positions)	63 dB	80 dB

## Related Information

- [“Environmental Specifications” on page 3](#)
- [“Power Source Requirements” on page 4](#)

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# Agency Compliance Specifications

Refer to the *Sun SPARC Enterprise T5440 Server Safety and Compliance Guide* for a full list of agency compliance specifications.

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# Operating Environment Requirements

This section contains the following topics:

- [“Environmental Control System” on page 7](#)
- [“Electrical Power” on page 7](#)
- [“Ambient Temperature” on page 8](#)
- [“Ambient Relative Humidity” on page 8](#)

- [“Airflow Considerations” on page 8](#)

## Environmental Control System

Your environmental control system must provide intake air for the server that complies with the limits specified in [“Environmental Specifications” on page 3](#).

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

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

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

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The servers have been tested to meet all functional requirements when operating in the operating environmental limits presented in [“Environmental Specifications” on page 3](#). 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

- [“Minimum Clearance for Service Access” on page 2](#)
- [“Environmental Specifications” on page 3](#)
- [“Ambient Temperature” on page 8](#)
- [“Ambient Relative Humidity” on page 8](#)
- [“Airflow Considerations” on page 8](#)

## 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

- [“Calculating Maximum Input Current” on page 5](#)

# 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

- [“Environmental Specifications” on page 3](#)
- [“Ambient Relative Humidity” on page 8](#)
- [“Airflow Considerations” on page 8](#)

# 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%. ESD becomes critical when levels drop below 30%.

## Related Information

- [“Environmental Specifications” on page 3](#)
- [“Ambient Temperature” on page 8](#)
- [“Airflow Considerations” on page 8](#)

# 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 ventilation openings, such as cabinet doors, for both the inlet and exhaust of the server provide a minimum open area of 460 cm<sup>2</sup> (71.3 in.<sup>2</sup>) each. This ventilation equates to a 60% open area perforation pattern across the front and rear area of the server. You must evaluate the impact of other open area characteristics that are more restrictive.
- 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 inlet and exhaust impedance (available open area). These values also assume a uniform distribution of the open area across the inlet and exhaust areas. Use greater clearance values to improve cooling performance.

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**Note** – The combination of inlet and exhaust restrictions such as cabinet doors, and the spacing of Oracle’s Sun SPARC Enterprise T5440 server from the doors can affect the cooling performance of the server. You must evaluate the effect of these criteria.

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- 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**

- [“Environmental Specifications” on page 3](#)
- [“Ambient Temperature” on page 8](#)
- [“Ambient Relative Humidity” on page 8](#)



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