Dell Networking
S6000-Open Networking (ON)
Getting Started Guide

Publication Date: April 2014

Regulatory Model: S6000

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates potential damage to the hardware or loss of data if you do not follow the instructions.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Regulatory Model: S6000

2014 - 04 P/N TPN9J Rev. A00

Contents

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About this Guide

This document is intended as a Getting Started Guide to get new systems up and running and ready for configuration. For complete installation and configuration information, refer to *Installing the S6000-Open Networking (ON) System*.

2

Introduction

The S6000-ON is a fully featured switch/router one rack unit (RU) system that you can deploy as a spine, leaf, or top of rack (ToR) device where you require 10Gb and/or 40Gb connections. It contains 32 ports of 40G that you can use to create a configuration of 96 ports of 10G small form-factor pluggable plus (SFP+) (using breakout cables) and eight ports of 40G quad small form-factor pluggable plus (QSFP+).

In a data center network, the S6000-ON switch provides converged network support and interoperates with Dell Networking and third-party network devices.

By providing increased 40GbE bandwidth for device interconnection in a shared network storage environment, with the possibility of splitting 40GbE quad small form-factor pluggable plus (QSFP+) uplinks into 10GbE SFP+ connections, the S6000-ON switch is perfectly positioned to help transition a data center with multiple speed requirements.

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Hardware Overview

This section contains information about device characteristics and modular hardware configurations for the S6000-ON switch.

The S6000-ON has the following physical dimensions:

- 434 x 460 x 43.5 mm (W x D x H).
- 17.09 x 18.11 x 1.71 inches (W x D x H).

The S6000-ON has a chassis design with 1280Gbps switching bandwidth as listed below:

- 32 port 40G QSFP+
- Up to 96 10G ports with QSFP+ breakout

The system also provides one RS-232 interface RJ-45 console port and a dedicated Ethernet management port for out-of-band (OOB) management functions.

The S6000-ON has the following features:

- Supports one universal serial bus (USB-A) port
- Supports one USB-B console port
- Thirty-two 40Gbps QSFP+ ports for 40Gbps transceivers
- On-board high-performance central processing unit (CPU) system with large memory
- Temperature monitoring
- Software-readable thermal monitor
- Real time clock (RTC) support
- Hot-plugging redundant power supply
- Current monitoring for power management
- Three removable fan modules
- Standard 1U chassis high

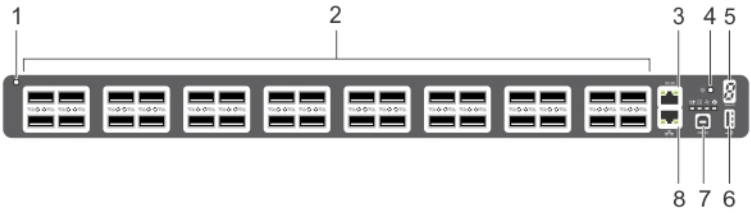
I/O Panel

The I/O panel includes:

- Thirty-two fixed QSFP+ ports
- One USB-A 2.0 port
- One USB-B serial console port
- One RS-232 serial console port
- One 10/100/1000BaseT (RJ-45) Ethernet management port

Figure 3-1 shows the S6000-ON I/O panel.

Figure 3-1. S6000-ON I/O Panel



1 - System LED

2 - Thirty-two QSFP+ Ports

3 - Serial Console

4 - Reset

5 - Stack ID

6 - USB-A

7 - USB-B Console

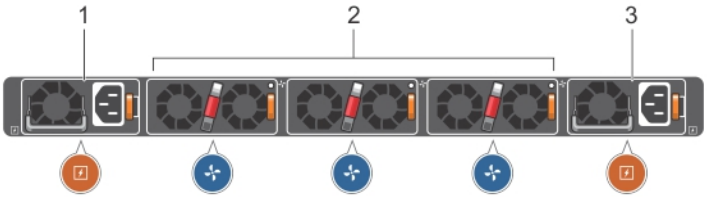
8 - Management

NOTE: The system light emitting diodes (LEDs) are on the I/O panel. The fan tray power indicators are on the Utility panel.

Utility Panel

The Utility panel side contains the fan and power modules. Figure 3-2 shows the S6000-ON power supplies and fan modules.

Figure 3-2. S6000-ON Power Supplies and Fan Modules



1 - Power Supply Unit (PSU) 1

2 - Fan Modules 1-3

3 - PSU 2

Power Supplies

The S6000-ON supports two hot-swappable PSUs. The S6000-ON supports AC power supplies with two air-flow directions (I/O to PSU and PSU to I/O). Two PSUs are required for full redundancy, but the system can operate with a single PSU.

NOTE: If you use a single PSU, install a blank plate in the other PSU slot. Dell Networking recommends using power supply 2 (PSU2) as the blank plate slot.

The PSUs are field replaceable. When running with full redundancy (two power supplies installed and running), you can remove and replace one PSU while the other PSU is running without disrupting traffic.

WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S6000-ON and its components.

CAUTION: To prevent electrical shock, ensure the S6000-ON is grounded properly. If you ground your equipment incorrectly, excessive emissions may result. To ensure the power cables meet your local electrical requirements, use a qualified electrician.

The power supply LED (on the I/O panel) indicates the power supply status:

- Off - no power
- Solid green - Power supply present and working

For additional LED information, refer to your third-party operating software documentation.

Fans

The S6000-ON supports three hot-swappable fans that provide cooling for the system. The S6000-ON has stock keeping units (SKUs) that support the following configurations. Installation of the fans is done as part of the factory install based on SKU type. The PSUs are installed at the customer site (refer to Power Supplies).

- AC PSU with fan airflow from I/O to PSU
- AC PSU with fan airflow from PSU to I/O

All fans and PSUs in a configuration must be in the same airflow direction.

The S6000-ON supports three fan trays with airflow directions from I/O to Utility or Utility to I/O. The PSU airflow directions are indicated with stickers on PSUs.

After Installing the S6000-ON

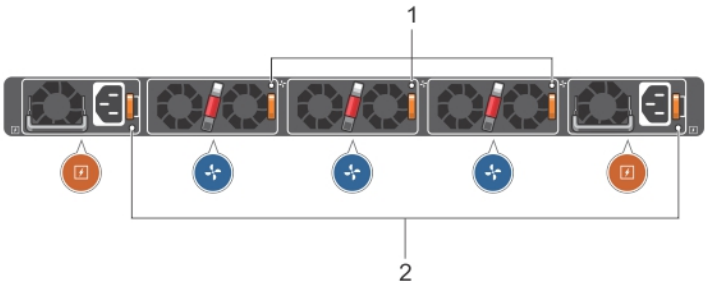
After you have securely installed and powered on the S6000-ON, to configure your system, refer to your ONIE-compatible third-party operating system documentation.

System Status

You can view S6000-ON status information using the system LEDs.

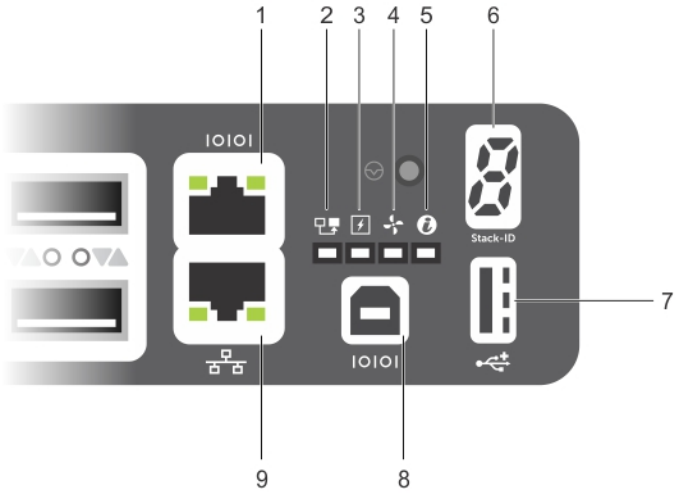
As shown in Figure 3-3, the S6000-ON includes LED displays on both the I/O and PSU side of the chassis.

Figure 3-3. S6000-ON PSU and Fan Tray LEDs



1- Fan Tray 1-3 LEDs

2 - PSU 1-2 LEDs



1 - Serial Console

2 - Master LED

3 - Power LED

4 - Fan Status LED

5 - Locator LED

6 - Stack ID

7 - USB-A

8 - USB-B Console

9 - Management

For LED information, refer to your third-party operating software documentation.

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Installation

Unpacking the Switch

This section describes the package contents and the steps to unpack the S6000-ON switch.

Package Contents

When unpacking each switch, make sure that the following items are included:

- One S6000-ON switch
- One RJ-45 to DB-9 female cable
- Two sets of rail kits (no tools required)
- Two PSUs
- One AC power cord (country/region specific)
- *Getting Started Guide*
- *Safety and Regulatory Information*
- *Warranty and Support Information*
- *Software License Agreement*

Unpacking Steps

NOTE: Before unpacking the switch, inspect the container and immediately report any evidence of damage.

Step	Task
1	Place the container on a clean, flat surface and cut all straps securing the container.
2	Open the container or remove the container top.
3	Carefully remove the switch from the container and place it on a secure and clean surface.
4	Remove all packing material.
5	Inspect the product and accessories for damage.

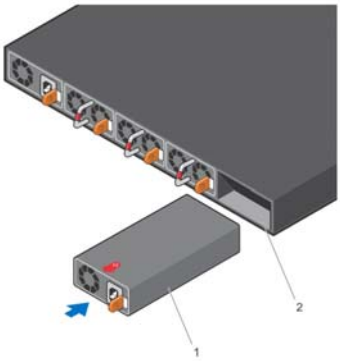
Installing an AC Power Supply

To install an AC power supply, follow these steps.

NOTE: The PSU slides into the slot smoothly. Do not force the PSU into a slot as this may damage the PSU or the S6000-ON chassis.

NOTE: Ensure that the PSU is correctly installed. When the PSU is correctly installed, the power connector is on the left side of the PSU and the status LED is at the bottom of the PSU.

NOTE: If you use a single PSU, install a blank plate in the other PSU slot. Dell Networking recommends using power supply 2 (PSU2) as the blank plate slot.

Step	Task
1	Remove the PSU slot cover from the S6000-ON (the PSU side of switch). You may select either of the two PSU slots.
2	Remove the PSU from the electro-static bag.
3	Insert the PSU into the switch PSU slot (insert the PSU exposed PCB edge connector first). The PSU slot is keyed such that the PSU can only be fully inserted in one orientation.  1 - PSU 2 - Slot When the PSU is installed correctly, it snaps into place and is flushed with the back of the switch.

Step	Task *(continued)*
4	Plug in the appropriate cord (AC three prong) from the switch PSU to the external power source (an AC wall outlet).
5	If you have a redundant PSU (a second PSU), repeat steps 1 through 4 using the second PSU slot on the S6000-ON switch.

NOTE: The system powers up as soon as the cables are connected between the power supply and the power source.

Rack Mount the Switch

You may either place the switch on the rack shelf or mount the switch directly into a 19" wide, EIA-310-E-compliant rack (four-post, two-post, or threaded methods). The Dell ReadyRails™ system is provided for 1U front-rack and two-post installations. The ReadyRails system includes two separately packaged rail assemblies and two rails that are shipped attached to the sides of the switch.

WARNING: **This is a condensed reference. Read the safety instructions in your Safety, Environmental, and Regulatory information booklet before you begin.**

CAUTION: Do not use the mounted Ready-Rails as a shelf or a workplace.

NOTE: The illustrations in this document are not intended to represent a specific switch.

Rack Mounting Safety Considerations

- Rack loading — Overloading or uneven loading of racks may result in shelf or rack failure, causing damage to the equipment and possible personal injury. Stabilize racks in a permanent location before loading begins. Mount the components beginning at the bottom of the rack, then work to the top. Do not exceed your rack load rating.
- Power considerations — Connect only to the power source specified on the unit. When you install multiple electrical components in a rack, ensure that the total component power ratings do not exceed the circuit capabilities. Overloaded power sources and extension cords present fire and shock hazards.

- Elevated ambient temperature — If you install the equipment in a closed rack assembly, the operating temperature of the rack environment may be greater than the room ambient temperature. Use care not to exceed the 40°C maximum ambient temperature of the switch.
- Reduced air flow — Install the equipment in the rack so that you do not compromise the amount of airflow required for safe operation of the equipment.
- Reliable earthing — Maintain reliable earthing of rack-mounted equipment. Pay particular attention to the supply connections other than the direct connections to the branch circuit; for example, use of power strips.
- Do not mount the equipment with the rear panel facing in the downward position.

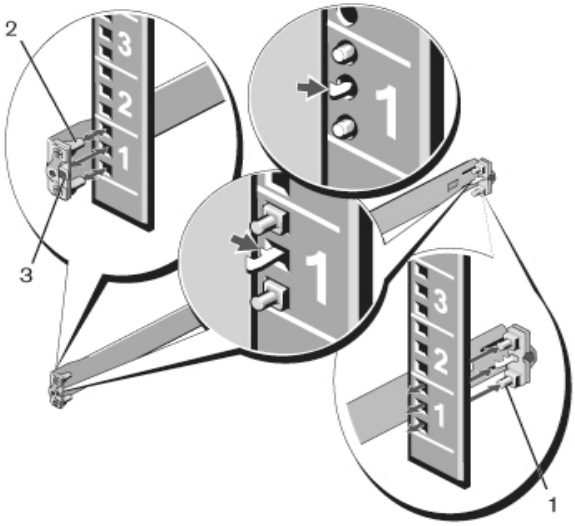
Installing the Dell ReadyRails System

The ReadyRails rack mounting system is provided to easily configure your rack so that you can install your switch. Install the ReadyRails system using the 1U tool-less method or one of three possible 1U tooled methods (two-post flush mount, two-post center mount, or four-post threaded).

1U Tool-less Configuration (Four-Post Square Hole or Unthreaded Round Hole):

1 With the ReadyRails flange ears facing outward, place one rail between the left and right vertical posts. Align and seat the rear flange rail pegs in the rear vertical post flange. In Figure 4-1, item 1 shows how the pegs appear in both the square and unthreaded round holes.

Figure 4-1. 1U Tool-less Configuration



2 Align and seat the front flange pegs in the holes on the front side of the vertical post. Refer to Figure 4-1, item 2.

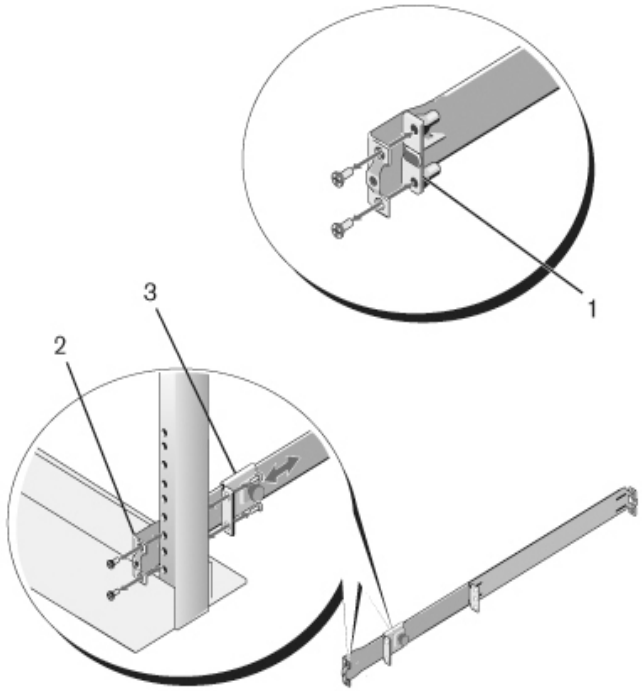
3 Repeat this procedure for the second rail.

4 To remove each rail, pull on the latch release button on each flange ear and unseat each rail. Refer to Figure 4-1, item 3.

Two-Post Flush-Mount Configuration:

1 For this configuration, remove the castings from the front side of each ReadyRails assembly. Refer to Figure 4-2, item 1. Use a Torx driver to remove the two screws from each front flange ear (on the switch side of the rail) and remove each casting. Retain the castings for future rack requirements. It is not necessary to remove the rear flange castings.

Figure 4-2. Two-Post Flush-Mount Configuration



2 Attach one rail to the front post flange with two user-supplied screws. Refer to Figure 4-2, item 2.

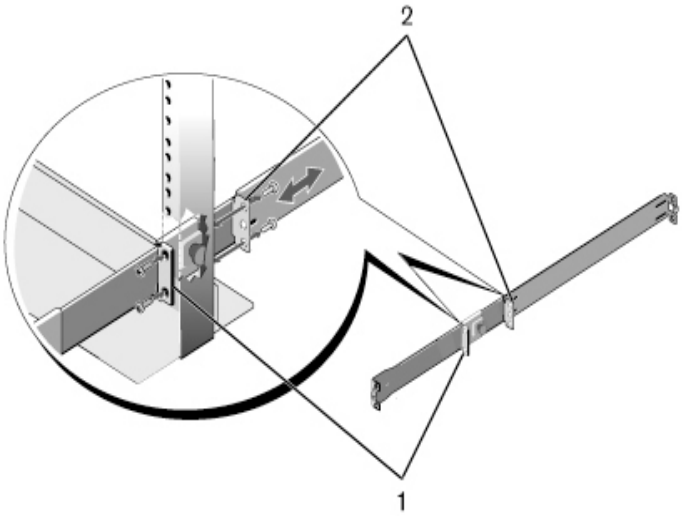
3 Slide the plunger bracket forward against the vertical post and secure the plunger bracket to the post flange with two user-supplied screws. Refer to Figure 4-2, item 3.

4 Repeat this procedure for the second rail.

Two-Post Center-Mount Configuration:

1 Slide the plunger bracket rearward until it clicks into place and secure the bracket to the front post flange with two user-supplied screws. Refer to Figure 4-3, item 1.

Figure 4-3. Two-Post Center-Mount Configuration



2 Slide the back bracket towards the post and secure it to the post flange with two user-supplied screws. Refer to Figure 4-3, item 2.

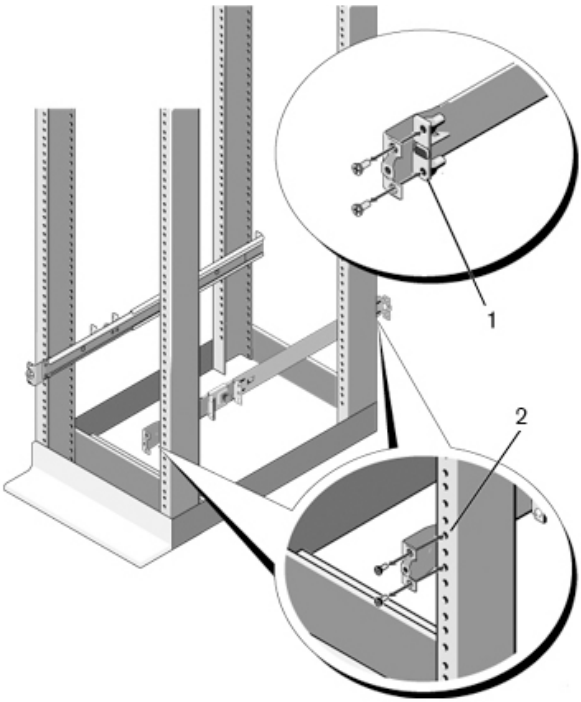
3 Repeat this procedure for the second rail.

Four-Post Threaded Configuration:

1 For this configuration, remove the flange ear castings from each end of the ReadyRails assemblies. Use a Torx driver to remove the two screws from each flange ear and remove each casting. Refer to Figure 4-4, item 1. Retain the castings for future rack requirements.

2 For each rail, attach the front and rear flanges to the post flanges with two user-supplied screws at each end. Refer to Figure 4-4, item 2.

Figure 4-4. Four-Post Threaded Configuration



Installing the Switch

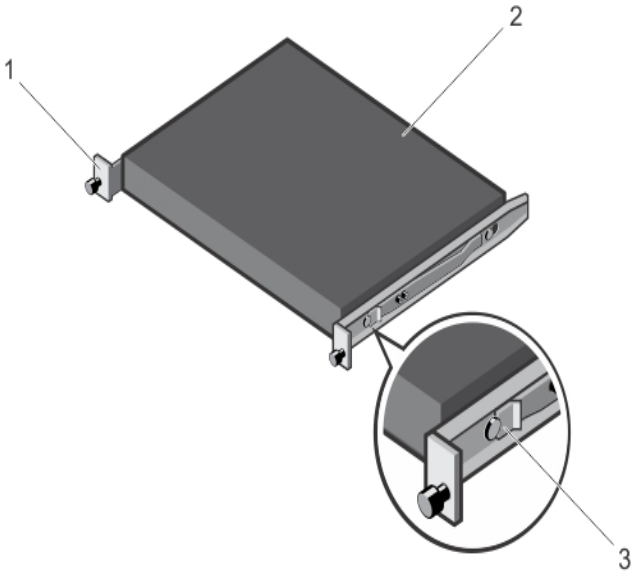
You can mount the switch in the 1U front-rack or 1U two-post (flush and center) configurations. The following is an example of a 1U front-rack configuration. For the 1U two-post (flush and center) configurations, slide the switch into the rails in the same manner as the four-post configurations.

1U Front-Rack Installation

Configure the rails that are attached to the switch.

1 Attach the switch rails (inner chassis members) to the S6000-ON switch. Figure 4-5, item 3 shows the detail for the front standoff with the locking tab.

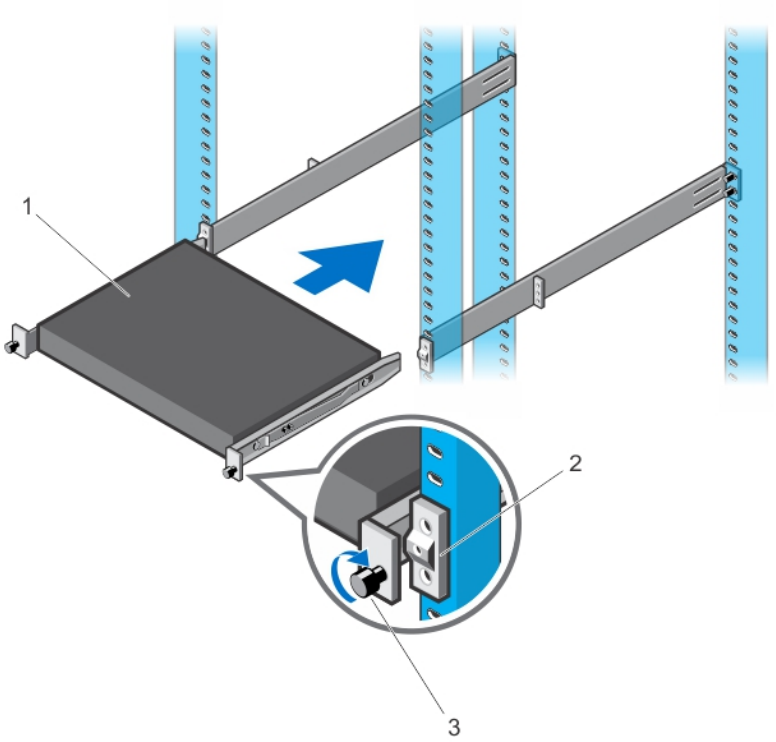
Figure 4-5. Attaching the Switch Rails



2 After you install both switch rails, line them up on the previously mounted Ready-Rails and slide the switch in until it is flush with front of rack. About three inches prior to full insertion, the rail locking feature engages to keep the switch from inadvertently sliding out of the rack and falling. Refer to Figure 4-6.

CAUTION: Do not use the mounted Ready-Rails as a shelf or a workplace.

Figure 4-6. Front Rack Installation



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Technical Specifications

Operate the product at an ambient temperature not higher than 40°C.

⚠ **Lithium Battery Caution: There is a danger of explosion if the battery is incorrectly replaced.** Replace only with same or equivalent type of battery. Dispose of the batteries according to the manufacturer's instructions.

Chassis Physical Design

Parameter	Specifications
Height	1.71 inches (43.5 mm)
Width	17.09 inches (434 mm)
Depth	18.11 inches (460 mm)

Environmental Parameters

Parameter	Specifications
Operating temperature	32° to 113°F (0° to 45°C)
Operating humidity	5 to 90% (RH), non-condensing
Storage temperature	–40° to 158°F (–40° to 70°C)
Storage humidity	5 to 90% (RH), non-condensing
Maximum thermal output	419.7 BTU/hr

Power Requirements

Parameter	Specifications
Power supply	100–240 VAC 50/60 Hz
Maximum current draw per system	2.9 A @ 286 watts/100vac 1.4 A @ 286 watts/200vac
Maximum power consumption	286 Watts
Reliability	MTBF 355,178 hours

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