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SRX4600 Firewall Hardware Guide

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SRX4600 Firewall Hardware Guide

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

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Table of Contents

About This Guide

Use this guide to install hardware and perform initial software configuration, routine maintenance, and troubleshooting for the SRX4600 Firewall.

After completing the installation and basic configuration procedures covered in this guide, refer to the Junos OS documentation for information about further software configuration.

RELATED DOCUMENTATION

- SRX4600 Firewall Quick Start Guide
- Safety Guide
- Transceivers Supported on SRX4600 Firewalls

CHAPTER 1

Overview

IN THIS CHAPTER

SRX4600 Firewall System Overview

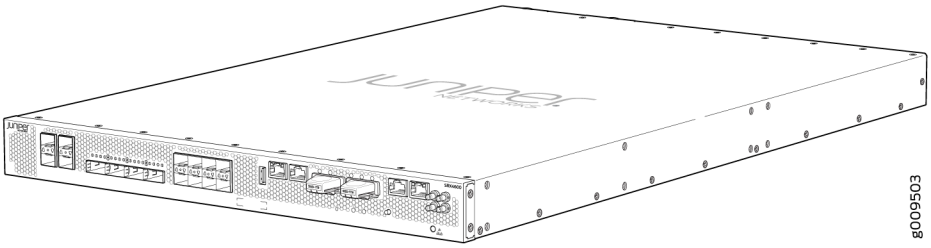
IN THIS SECTION

SRX4600 Firewall Overview

The Juniper Networks SRX4600 Firewall is a next-generation, high-performance, and scalable security services device. The firewall supports 75-Gbps Internet mix (IMIX) throughput, is suited for large enterprises and small to medium data centers.

The SRX4600 Firewall provides industry-leading next-generation firewall capabilities (AppID, UserFW, IPS, Content Security, and so on) and advanced threat detection and mitigation capabilities features such as SecIntel and ATP Cloud.
The Firewall features two high-performance Intel Xeon processors with 14 cores per processor.

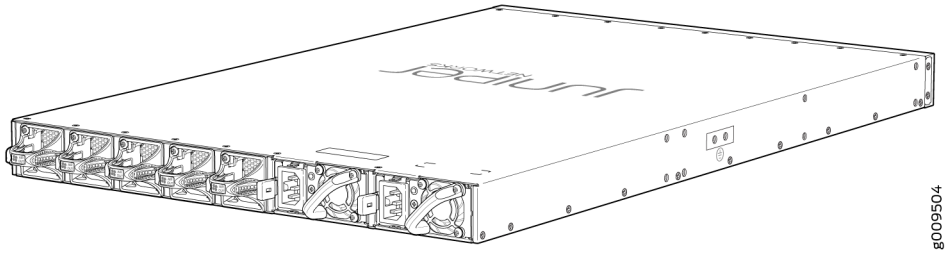
Figure 1: SRX4600 Firewall



The chassis is a 1 U high device designed for rack installation. The firewall is available in both AC-powered and DC-powered models. See Figure 2 on page 3 and Figure 3 on page 3:

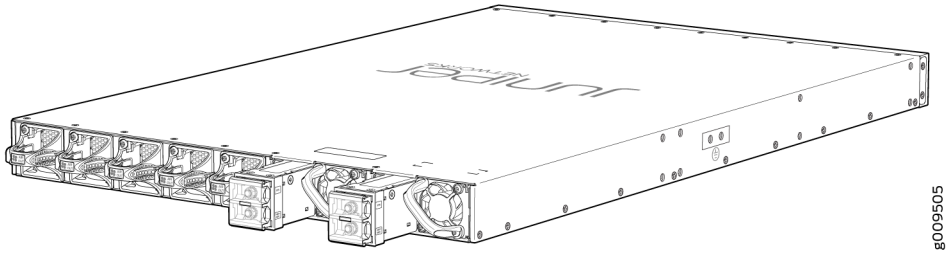
- SRX4600 (AC) — SRX4600 Firewall with dual AC power supplies

Figure 2: SRX4600 Firewall AC Model



- SRX4600 (DC) — SRX4600 Firewall with dual DC power supplies

Figure 3: SRX4600 Firewall DC Model



The SRX4600 Firewall is shipped with two field-replaceable 1-TB solid-state drives (SSDs). The usable memory on the 1-TB SSD is 960 GB.

The firewall runs the Junos Operating System (Junos OS) and can be managed using the Junos OS CLI, Junos Space, and J-Web.

Field-Replaceable Units in an SRX4600 Firewall

Field-replaceable units (FRUs) are components that you can replace at your site. The FRUs in an SRX4600 Firewall are:

- Solid-state drives (SSDs)
- Fan modules
- Power supplies
- SFP+ transceivers

- QSFP28 transceivers

The power supplies, fan modules, and transceivers can be removed and replaced without powering off the firewall or disrupting firewall functions.

> **NOTE**: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/support/tools/updateinstallbase/ . Failure to do so can result in significant delays if you need replacement parts. This note does not apply if you replace existing components with the same type of component.

Benefits of the SRX4600 Firewall

- High performance—The SRX4600 Firewall supports up to 95-Gbps firewall throughput (up to 75-Gbps of IMIX firewall throughput).
  Best-in-class security and advanced threat mitigation capabilities are offered as 20 Gbps of next-generation firewall, 20 Gbps of intrusion prevention system (IPS), and up to 16 Gbps of IPsec VPN in data center, enterprise campus, and regional headquarter deployments with IMIX traffic patterns.
- High-quality end-user experience—The SRX4600 recognizes more than 3500+ L3-L7 applications and nested applications in plain text or SSL-encrypted transactions.
  The firewall also integrates with Microsoft Active Directory and combines user information with application data to provide network-wide application and user visibility and control.

Understanding the SRX4600 Firewall Chassis

IN THIS SECTION

The SRX4600 Firewall chassis is a rigid sheet metal structure that houses all the firewall components.

Chassis Physical Specifications

Table 1 on page 5 summarizes the physical specifications for the firewall chassis.

Table 1: SRX4600 Firewall Chassis Physical Specifications

Description	Value
Chassis	Height: 1.72 in. (4.36 cm)
	Depth • 26.50 in. (67.31 cm) (front to rear, excluding handles of the Fan/PSU) • 27.29 in. (69.31 cm) (front to rear, including handles of the Fan/PSU of an SRX4600 Firewall AC Model) • 29.2 in. (74.168 cm) (front to rear, including handles of the Fan/PSU of an SRX4600 Firewall DC Model)
	Width • 17.36 in. (44.09 cm) (without the side-mounting brackets) • 19.00 in. (48.03 cm) (with the side-mounting brackets)
Fan module	Weight: 2.3 lb (1.04 kg)
AC power supply	Weight: 3.4 lb (1.54 kg)
DC power supply	Weight: 4.4 lb (1.99 kg)
Firewall weight	An AC device weighs approximately 38 lb (17.23 kg)
	A DC device weighs approximately 40 lb (18.14 kg)

Table 1: SRX4600 Firewall Chassis Physical Specifications *(Continued)*

Description	Value
Form factor	1 U, standard 19-inch rack-mountable.

Chassis Front Panel

Figure 4 on page 6 shows the front panel of the SRX4600 Firewall.

Figure 4: Front Panel of the SRX4600 Firewall

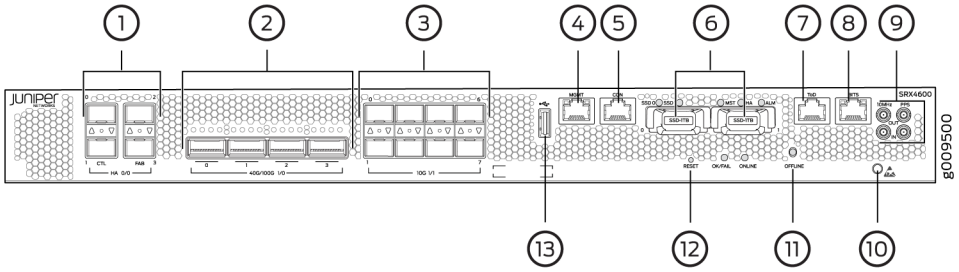


Table 2 on page 6 lists and describes the front panel components of the firewall.

Table 2: SRX4600 Firewall Components on the Front Panel

Number	Component (Label on the Chassis)	Description
1	Chassis cluster ports (**HA**)	Two 1GbE/10GbE (SFP+) chassis cluster control **CTL** ports and two 1GbE/10GbE (SFP+) dedicated chassis cluster fabric **FAB** ports.
2	QSFP28 ports	Four 40/100-Gigabit Ethernet QSFP28 (quad small form-factor pluggable) ports for network traffic. By default each port is configured as a 40-Gigabit Ethernet port.

Table 2: SRX4600 Firewall Components on the Front Panel *(Continued)*

Number	Component (Label on the Chassis)	Description
3	SFP+ ports	Eight 1/10-Gigabit Ethernet SFP+ ports for network traffic. By default each port is configured as a 10-Gigabit Ethernet port.
4	Management port (**MGMT**)	Management port
5	Console port (**CON**)	You can connect a laptop to the firewall for CLI management. The port uses an RJ-45 serial connection, is configured as DTE, and supports the RS-232 (EIA-232) standard.
6	SSDs	The two SSDs are FRUs and they are for storage.
7	**ToD**	Time-of-Day RJ-45 port
8	**BITS**	BITS RJ-45 port
9	**10MHz** GPS port	Output clock at 10 Mhz
	PPS	1 pulse per second (PPS) output connection for clocking messages
10	ESD socket	For personal safety, while working on the firewall, use the ESD outlet to plug in an ESD grounding strap to prevent your body from sending static charges to the firewall.
11	**OFFLINE**	**OFFLINE** button
12	**RESET**	To cold reboot the firewall, press and hold the **RESET** button for less than 5 seconds.
13	USB 2.0 port	One USB 2.0 port that accepts a USB storage device.

Chassis and Component Status LEDs

Figure 5 on page 8 shows the SRX4600 Firewall chassis and component status LEDs.

Figure 5: SRX4600 Firewall Chassis and Component Status LEDs

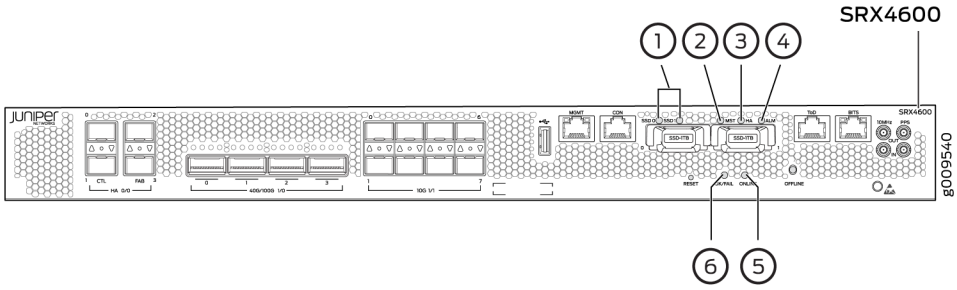


Table 3: SRX4600 Firewall Chassis and Component Status LEDs

Number	LED (Label on the Chassis)	Description
1	**SSD 0** & **SSD 1**	• Green, blinking—SSD is active and is being accessed. • Amber, blip—SSD Locate bit is set. • Amber, blinking—SSD has some issue. • Off—SSD is active, but not being accessed.
2	**MST**	• Blue—The MASTER LED remains blue as long the firewall is connected to power.
3	**HA**	• Green—HA is working fine. • Red—HA has some issues. • Off—Cluster not set.

Table 3: SRX4600 Firewall Chassis and Component Status LEDs *(Continued)*

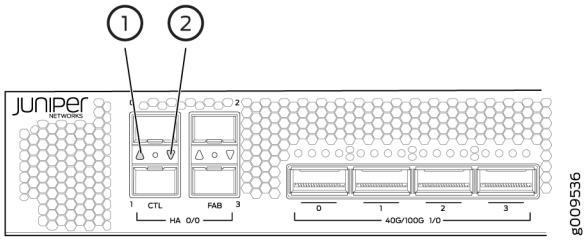
Number	LED (Label on the Chassis)	Description
4	**ALM**	• Red—Major alarm • Amber—Minor alarm • Red, blinking—Both major and minor alarms • Off—No alarm
5	**ONLINE**	• Green, blinking—FPC initial boot-up. • Solid green—Both FPC0 and FPC1 are online. • Amber—Either FPC0 or FPC1 is offline. • Off—firewall is powered off or is halted.
6	**OK/FAIL**	• Green—No issue with system power supply. • Amber—Power failure or issue with one of the power supplies.

Interface Ports LEDs

HA Port LEDs

Each HA port has one Link activity LED below or above it. Figure 6 on page 10 shows the location of the LEDs and Table 4 on page 10 describes the LEDs.

Figure 6: HA Port LEDs



1– Link activity LED of HA port **0**	2– Link activity LED of HA port **1**

Table 4: HA Port LEDs

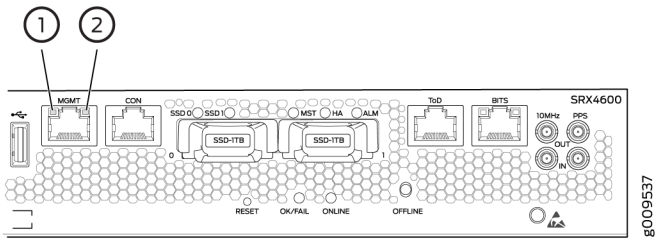
LED	Description
Link activity LED	• Solid green—A link is established. • Off—There is no link established.

Management Port LEDs

The management port has two LEDs that indicate link activity and status of the management port.

Figure 7 on page 10 shows the location of the LEDs on the management port and Table 5 on page 11 describes the LEDs.

Figure 7: Management Port LEDs



1– Link activity LED	2– Status LED

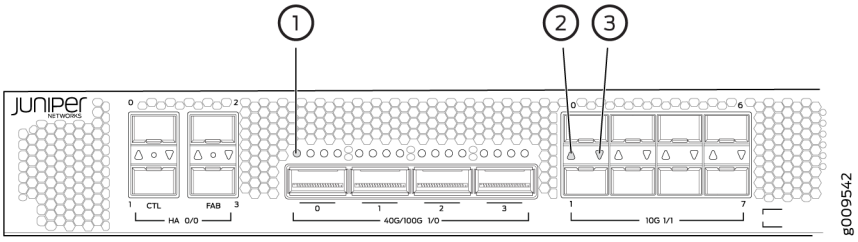
Table 5: Management Port LEDs

LED	Description
Link activity LED	• Solid green—A link is established, but there is no activity on the link. • Blinking green—There is link activity. • Off—There is no link established.
Speed	• Solid green—100-Mbps link is established. • Solid amber—1000-Mbps link is established. • Off—There is no link established.

Network Port LEDs

Each QSFP28 port has one link activity LED above it and each SFP+ port has one link activity LED located above or below it. Figure 8 on page 11 shows the location of the LEDs and Table 6 on page 12 describes the LEDs.

Figure 8: Network Port LEDs



1– Link activity LED of QSFP28 port **0**	3– Link activity LED of SFP+ port **1**
2– Link activity LED of SFP+ port **0**	

Table 6: Network Port LEDs

LED	Description
Link activity LED	• Solid green—There is link activity. • Off—There is no link established.

Port and Interface Numbering

Each port on the firewall corresponds to a unique interface name in the CLI. The four Chassis cluster (HA) ports (referred to as PIC 0 ports of FPC 0), four 40/100-Gigabit Ethernet QSFP28 (quad small form-factor pluggable) ports (referred to as PIC 0 ports of FPC 1), and eight 1/10-Gigabit Ethernet SFP+ ports (referred to as PIC 1 ports of FPC 1). Figure 9 on page 13 shows the SRX4600 Interface Port numbering.

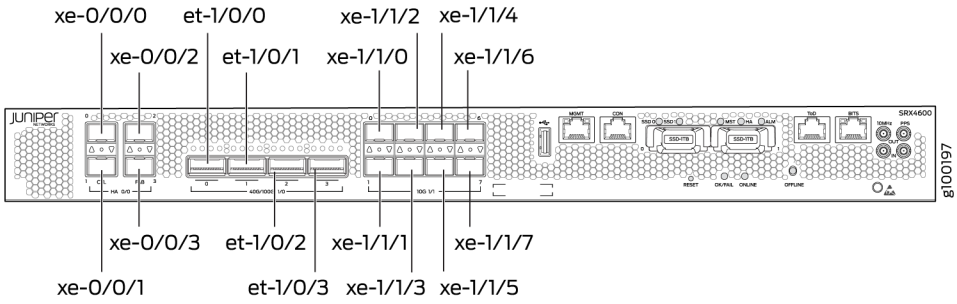
In the syntax of an interface name, a hyphen (-) separates the media type from the *FPC* slot number (represented as an `FPC` in the CLI). The FPC slot number corresponds to the first number in the interface. The second number in the interface corresponds to the PIC number. The last number in the interface matches the port number on the PIC. Slashes (/) separate the FPC number from the PIC number and port number:

type-fpc/pic/port

- *type*—Media type, which identifies the network device. For example:
  - ge—Gigabit Ethernet interface
  - so—SONET/SDH interface
  - xe—10-Gigabit Ethernet interface

  For a complete list of media types, see Interface Naming Overview.
- *fpc*—FPC number, 0 or 1.
- *pic*—PIC number, 0 or 1.
- *port*—Port number.

Figure 9: SRX4600 Interface Port Numbering



The maximum capacity of an SRX4600 Firewall is 400 Gbps, which cannot be oversubscribed. In SRX4600, the network ports are available in two groups (referred to as PICs), with restrictions around the number and type of ports that can be configured without over-subscribtion.

Table 7 on page 13 lists the different port configurations you can have on SRX4600.

Table 7: SRX4600 Firewall Port Configurations

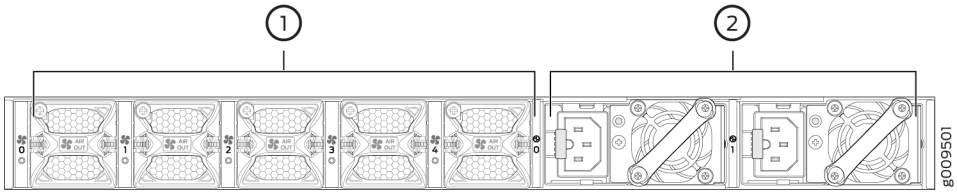
Interface Options	PIC0				PIC1							
	1/0/0	1/0/1	1/0/2	1/0/3	1/1/0	1/1/1	1/1/2	1/1/3	1/1/4	1/1/5	1/1/6	1/1/7
1	4x10G or 1x40G	4x10G or 1x40G	4x10G or 1x40G	4x10G or 1x40G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G
2	100G	100G	4x10G or 1x40G	4x10G or 1x40G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G	1G or 10G
3	100G	100G	100G	100G	-	-	-	-	-	-	-	-

For information on port configurations and rate-selectability, see SRX4600 Port Speed Overview and "Understanding the SRX4600 Firewall Chassis" on page 4.

Chassis Rear Panel

Figure 10 on page 14 shows the rear panel of the SRX4600 Firewall with AC power supplies.

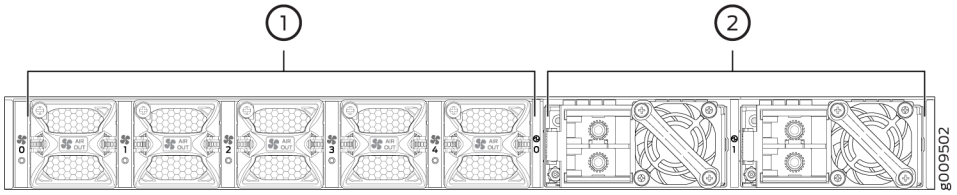
Figure 10: Rear Panel of the SRX4600 Firewall with AC Power Supplies



1– Fan modules	2– AC power supplies

Figure 11 on page 14 shows the rear panel of the SRX4600 Firewall with DC power supplies.

Figure 11: Rear Panel of the SRX4600 Firewall with DC Power Supplies



1– Fan modules	2– DC power supplies

Table 8 on page 14 lists and describes the rear panel components of the firewall.

Table 8: SRX4600 Firewall Components on the Rear Panel

Component	Description
Fan modules	Five airflow out (AFO) fan modules (4+1 redundancy). Five fan modules for cooling the firewall and its components. Four fan modules are required for proper air flow across the chassis internal components. The fifth fan module provides redundancy.
PSUs (Power Supply Units)	Two power supply slots. Two 1600W AC or two 1100W DC power supply units (1+1 redundancy) are provided with the firewall.

Understanding the SRX4600 Firewall Cooling System and Air Flow

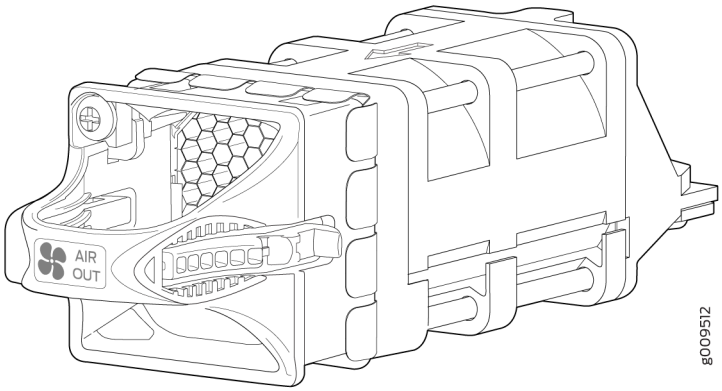
IN THIS SECTION

The cooling system in an SRX4600 Firewall consists of five fan modules (4+1 redundancy) located at the rear of the chassis.

Fan Module

The five fan modules are numbered 0 through 4 from counting left to right. Each fan module slot has a fan icon next to it. Figure 12 on page 15 shows the fan module.

Figure 12: SRX4600 Firewall Fan Module



You remove and replace a fan module from the FRU end of the chassis. The firewall continues to operate for a limited period of time (30 seconds) during the replacement of the fan module without thermal shutdown.

NOTE: All fan modules must be installed for optimal operation of the firewall.

The fan modules are field-replaceable units (FRUs) and can be removed and replaced without powering off the firewall or disrupting firewall functions.

Position the firewall in such a manner that the **AIR OUT** labels on firewall components are next to the hot aisle.

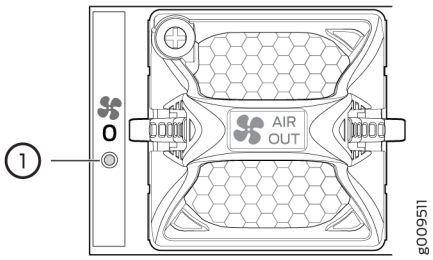
Under normal operating conditions, the fan modules operate at a moderate speed. Temperature sensors in the chassis monitor the temperature within the chassis.

Fan Module LEDs

Each fan module has a LED next to it.

Figure 13 on page 16 shows the location of the LED next to the fan module.

Figure 13: Location of Fan Module LED in an SRX4600 Firewall



1–	Fan module LED

Table 9 on page 17 describes the function of the fan module LED.

Table 9: Fan Module LED

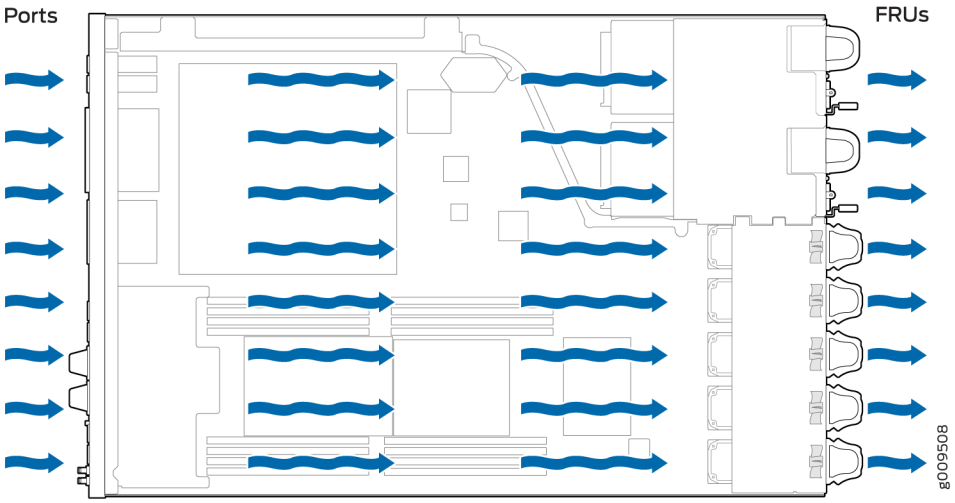
Name	Color	State	Description
Fan	Green	On steadily	The fan module is operating normally. The system has verified that the module is engaged, that the airflow is in the correct direction, and that the fan is operating correctly.
	Amber	Blinking	An error has been detected in the fan module. Replace the fan module as soon as possible. Either the fan has failed or it is seated incorrectly. To maintain proper airflow through the chassis, leave the fan module installed in the chassis until you are ready to replace it.

CAUTION: The system raises an alarm if a fan module fails or if the ambient temperature inside the chassis rises above the acceptable range. If the temperature inside the chassis rises above the threshold temperature, the system shuts down automatically.

Airflow Through Chassis

The direction of airflow in the chassis is from Port-to-FRU, that is, air comes in through vents on the end with ports and air exhausts out the end with the fans (also known as front-to-back airflow). See Figure 14 on page 18.

Figure 14: Airflow Through Chassis



The airflow out (AFO) fan modules draw air through vents on the front of the firewall chassis and exhaust the air through the back of the chassis.

RELATED DOCUMENTATION

- Clearance Requirements for Airflow and Hardware Maintenance for SRX4600 Firewalls | 32
- Maintaining the SRX4600 Cooling System | 71

SRX4600 Power System

IN THIS SECTION

Understanding the SRX4600 Firewall Power Supply

IN THIS SECTION

The SRX4600 Firewall ships with two AC or two DC power supplies (1+1 redundancy) preinstalled in the rear panel of the chassis in slots labeled **0** and **1**. The SRX4600 Firewall power supply is a field-replaceable unit (FRU) and you can install it without powering off the firewall or disrupting the firewall function.

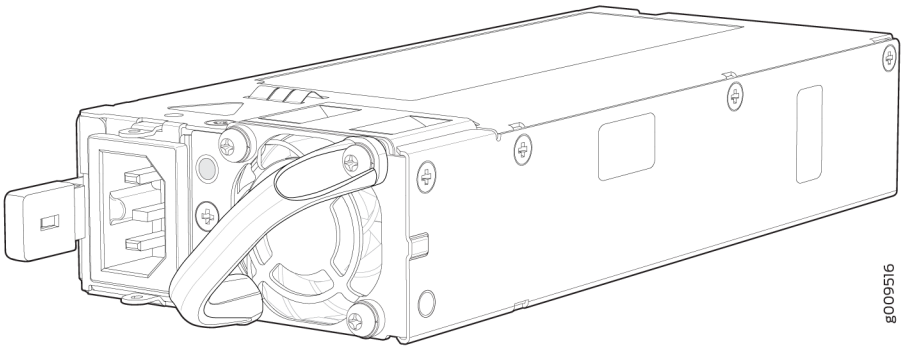
AC Power Supply

The AC power supply is a FRU and you can install it without powering off the firewall or disrupting the firewall function.

Each AC power supply weighs approximately 3.4 lb (1.54 kg) and consists of a handle, an ejection lever, an AC appliance inlet, an internal fan, and an LED to monitor the status of the power supply. The AC power supply supports both low-voltage line (800 W) and high-voltage line (1600 W).

Each inlet requires a dedicated AC power feed and a dedicated customer-site circuit breaker. We recommend that you use a minimum 15 A (110 VAC) customer-site circuit breaker, or as required by local code. Figure 15 on page 19 shows the AC power supply.

Figure 15: SRX4600 Firewall AC Power Supply



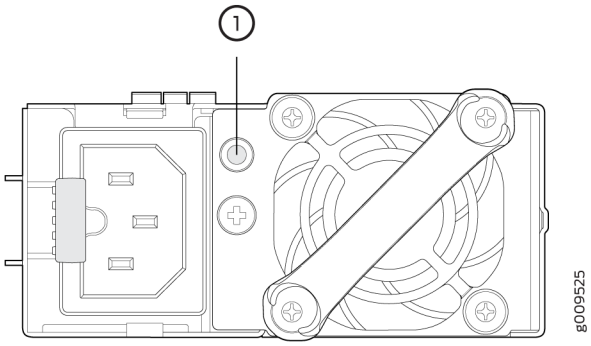
Each AC power supply provides power to all components in the firewall. The two power supplies provide full power redundancy to the firewall. If one power supply fails or is removed, the second power supply balances the electrical load without interruption. The firewall reassesses the power required to support the firewall configuration and issues error messages if the available power is insufficient.

For instructions on installing the power supply, see "Installing the SRX4600 Firewall AC Power Supply" on page 77.

WARNING: The firewall is pluggable type A equipment installed in a restricted-access location. It has a separate protective earthing terminal provided on the chassis in addition to the grounding pin of the power supply cord. This separate protective earthing terminal must be permanently connected to earth ground. See "Connecting Earth Ground to an SRX4600 Firewall" on page 59.

Figure 16 on page 20 shows the location of one bicolor LED on the faceplate of an AC power supply. This LED displays information about the status of the power supply.

Figure 16: Location of AC Power Supply LED



1– AC power supply LED

Table 10 on page 21 describes the LED on an AC power supply in an SRX4600 Firewall.

Table 10: AC Power Supply LED

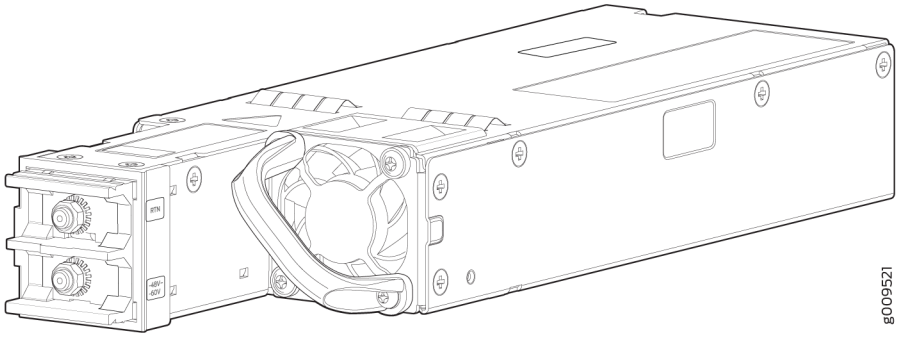
LED State	Description
Unlit	Indicates one of the following: • Power supply is disconnected from AC power feed. • AC power input voltage is not within normal operating range. • No AC power input.
Green	On steadily—Power supply is functioning normally.
Amber	Blinking—Power supply has failed.

DC Power Supply

The DC power supply is a FRU and you can install it without powering off the firewall or disrupting the firewall function.

Each DC power supply weighs approximately 4.4 lb (1.99 kg) and consists of a handle, an ejection lever, a status LED, and a terminal block that provides a single DC input (–48 VDC and return) that requires a dedicated customer-site circuit breaker. We recommend that you use a dedicated customer-site circuit breaker rated for 15 A (–48 VDC) minimum, or as required by local code. The DC power supply gives an output of 1100 W. Figure 17 on page 22 shows the DC power supply.

Figure 17: SRX4600 Firewall DC Power Supply

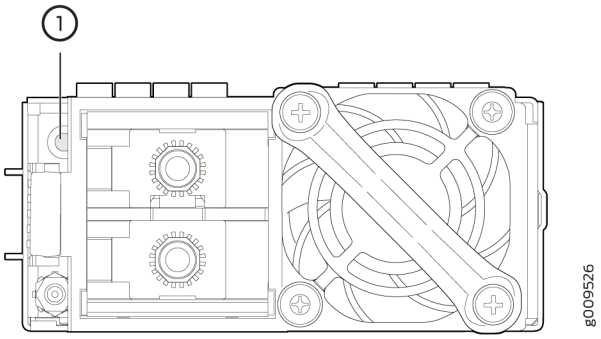


Each DC power supply provides power to all components in the firewall. The two power supplies provide full power redundancy to the firewall. If one power supply fails or is removed, the second power supply balances the electrical load without interruption. The firewall reassesses the power required to support the firewall configuration and issues error messages if the available power is insufficient.

For instructions on installing the power supply, see "Installing the SRX4600 Firewall DC Power Supply" on page 80.

Figure 18 on page 22 shows the location of one bicolor LED on the faceplate of an DC power supply. This LED displays information about the status of the power supply.

Figure 18: Location of DC Power Supply LED



1– DC power supply LED

Table 11 on page 23 describes the LED on a DC power supply in an SRX4600 Firewall.

Table 11: DC Power Supply LED

LED State	Description
Unlit	Indicates one of the following: • Power supply is disconnected from DC power feed. • DC power input voltage is not within normal operating range. • No DC power input.
Green	On steadily—Power supply is functioning normally.
Amber	Blinking—Power supply has failed.

SRX4600 Firewall AC Power Supply Specifications

Table 12 on page 23 lists the specifications for an AC power supply.

Table 12: AC Power Supply Specifications

Item	Specification
AC input voltage	Operating range: • Low-voltage line: 100–127 VAC • High-voltage line: 200–240 VAC
AC input line frequency	50–60 Hz
AC input current rating	• Low-voltage line: 10.8 A • High-voltage line: 10.8 A

Table 12: AC Power Supply Specifications *(Continued)*

Item	Specification
AC output power	• Low-voltage line: 800 W • High-voltage line: 1600 W
Maximum System Power Requirement	~800 W
System Thermal Output = (Maximum System Power Requirement) * 3.41 Note: 1 W = 3.41 BTU/Hour	2728 BTU/Hour

SRX4600 Firewall AC Power Cord Specifications

A detachable AC power cord is supplied with the AC power supplies. The coupler is type C13 as described by International Electrotechnical Commission (IEC) standard 60320. The plug end of the power cord fits into the power source outlet that is standard for your geographical location.

NOTE: In North America, AC power cords must not exceed 4.5 m (approximately 14.75 ft) in length, to comply with National Electrical code (NEC) Section 400-8 (NFPA 75, 5-2.2) and 210-52, and Canadian Electrical Code (CEC) Section 4-010(3). The cords supplied with the firewall are in compliance.

Table 13 on page 24 provides power cord specifications, and Figure 19 on page 25 depicts the plug on the AC power cord provided for each country or region.

Table 13: AC Power Cord Specifications

Country	Electrical Specification	Plug Standards
Australia	250 VAC, 10 A, 50 Hz	AS/NZ 3112-1993
China	250 VAC, 10 A, 50 Hz	GB2099.1 1996 and GB 1002 1996 (CH1-10P)

Table 13: AC Power Cord Specifications *(Continued)*

Country	Electrical Specification	Plug Standards
Europe (except Italy and United Kingdom)	250 VAC, 10 A, 50 Hz	CEE (7) VII
Italy	250 VAC, 10 A, 50 Hz	CEI 23-16/VII
Japan	125 VAC, 12 A, 50 or 60 Hz	JIS 8303
North America	125 VAC, 10 A, 60 Hz	NEMA 5-15
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363A

Figure 19: AC Plug Types

NOTE: Power cords and cables must not block access to firewall components or drape where people might trip on them.

CAUTION: The AC power cord for the firewall is intended for use with the firewall only and not for any other use.

SRX4600 Firewall DC Power Supply Specifications

Table 14 on page 26 lists the power supply specifications for a DC power supply.

Table 14: DC Power Supply Specifications

Item	Specifications
DC input voltage	• Minimum operating voltage: –40 VDC • Nominal operating voltage: –48 VDC • Operating voltage range: –40 VDC through –72 VDC
DC input current rating	32 A @ –48 VDC
Output power	1100 W

RELATED DOCUMENTATION

Maintaining the SRX4600 Power System | 75

2

CHAPTER

Site Planning, Preparation, and Specifications

IN THIS CHAPTER

Site Preparation Checklist for the SRX4600 Firewall

Table 15 on page 28 provides a checklist of tasks you need to perform when preparing a site for installing the SRX4600 Firewall.

Table 15: Site Preparation Checklist for SRX4600 Firewall Installation

Item or Task	Additional Information	Performed by	Date	Notes
Power				
Measure distance between external power sources and device installation site.				
Locate sites for connection of system grounding.				
Calculate the power consumption and requirements.	"SRX4600 Firewall AC Power Supply Specifications" on page 23 "SRX4600 Firewall DC Power Supply Specifications" on page 25			
Environment				
Verify that environmental factors such as temperature and humidity do not exceed firewall tolerances.	"SRX4600 Firewall Environmental Specifications" on page 30			
Rack or Cabinet				
Verify that your rack or cabinet meets the minimum requirements for the installation of the device.	"SRX4600 Firewall Rack Requirements" on page 34 "Cabinet Requirements" on page 36			

Table 15: Site Preparation Checklist for SRX4600 Firewall Installation *(Continued)*

Item or Task	Additional Information	Performed by	Date	Notes
Plan rack location, including required space clearances.				
Secure the rack or cabinet to the floor and building structure.				
Cables				
Acquire cables and connectors: • Determine the number of cables needed based on your planned configuration. • Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected.				
Plan the cable routing and management.				

RELATED DOCUMENTATION

SRX4600 Firewall Installation Overview | 49

SRX4600 Site Guidelines and Requirements

IN THIS SECTION

SRX4600 Firewall Environmental Specifications

Table 16 on page 30 specifies the environmental specifications required for normal Firewall operation. In addition, the site should be as dust-free as possible.

Table 16: Firewall Environmental Specifications

Description	Value
Altitude	No performance degradation to 6,562 ft (2000 m)
Relative humidity	Normal operation ensured in relative humidity range of 5% through 90%, non-condensing
Temperature	Normal operation ensured in temperature range of 32°F (0°C) through 104°F (40°C) Non-operating storage temperature in shipping crate: –40°F (–40°C) through 158°F (70°C)
Seismic	Tested to meet Telcordia Technologies Zone 4 earthquake requirements

NOTE: Install the firewall only in restricted-access areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.

General Site Guidelines

Efficient device operation requires proper site planning and maintenance. It also requires proper layout of the equipment, rack or cabinet, and wiring closet.

To plan and create an acceptable operating environment for your device and prevent environmentally caused equipment failures:

- Keep the area around the chassis free from dust and conductive material, such as metal flakes.
- Follow the prescribed airflow guidelines to ensure that the cooling system functions properly. Ensure that the exhaust from other equipment does not blow into the intake vents of the device.
- Follow the prescribed electrostatic discharge (ESD) prevention procedures to prevent damaging the equipment. Static discharge can cause components to fail completely or intermittently over time.
- Install the device in a secure area, so that only authorized personnel can access the device.

Site Electrical Wiring Guidelines

Table 17 on page 31 describes the factors you must consider while planning the electrical wiring at your site.

WARNING: You must provide a properly grounded and shielded environment and use electrical surge-suppression devices.

Avertissement Vous devez établir un environnement protégé et convenablement mis à la terre et utiliser des dispositifs de parasurtension.

Table 17: Site Electrical Wiring Guidelines

Site Wiring Factor	Guidelines
Signaling limitations	If your site experiences any of the following problems, consult experts in electrical surge suppression and shielding: • Radio frequency interference (RFI) because of improperly installed wires • Damage from lightning strikes occuring when wires exceed recommended distances or pass between buildings • Electromagnetic pulses (EMPs) caused by lightning damaging unshielded conductors and electronic devices

Table 17: Site Electrical Wiring Guidelines *(Continued)*

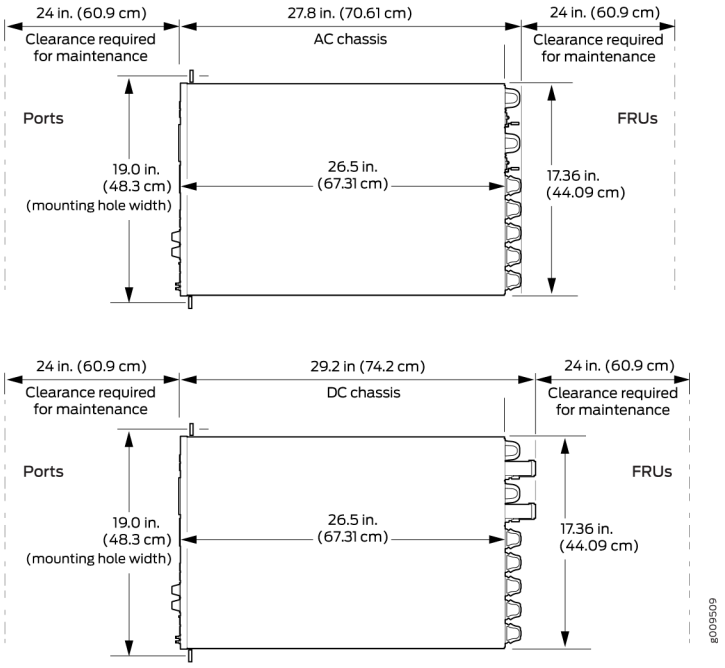
Site Wiring Factor	Guidelines
Radio frequency interference	To reduce or eliminate RFI from your site wiring, do the following: • Use a twisted-pair cable with a good distribution of grounding conductors. • To exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal, when applicable.
Electromagnetic compatibility	If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, seek expert advice. Strong sources of electromagnetic interference (EMI) can cause: • Destruction of the signal drivers and receivers in the device. • Electrical hazards as a result of power surges conducted over the lines into the equipment.

Clearance Requirements for Airflow and Hardware Maintenance for SRX4600 Firewalls

When planning the installation site, you need to allow sufficient clearance around the firewall. Consider the following requirements:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. See Figure 20 on page 33.

Figure 20: Clearance Requirements for Airflow and Hardware Maintenance for an SRX4600 Firewall Chassis



- If you are mounting the firewall on a rack or cabinet along with other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the firewall as indicated in Table 18 on page 33.

Table 18 on page 33 provides information about the clearance requirements for maintaining optimum airflow and the distances necessary to facilitate easy maintenance of the firewall.

Table 18: Clearance Requirements for the SRX4600 Firewall

Location	Recommended Clearance	Requirement for Clearance
Front of the chassis	24.00 in. (60.90 cm)	Space for service personnel to remove and install hardware components
Rear of the chassis	24.00 in. (60.90 cm)	Space for service personnel to remove and install hardware components

Table 18: Clearance Requirements for the SRX4600 Firewall *(Continued)*

Location	Recommended Clearance	Requirement for Clearance
Between front-mounting flange and rack or cabinet edge	2.50 in. (6.35 cm)	Space for cable management and organization
Between both sides of the chassis and any non-heat-producing surface such as a wall or cabinet side	6.00 in. (15.24 cm)	Space for the cooling system to function properly and to maintain unrestricted airflow around the chassis

RELATED DOCUMENTATION

Understanding the SRX4600 Firewall Chassis | 4

SRX4600 Rack and Cabinet Requirements

IN THIS SECTION

SRX4600 Firewall Rack Requirements

You can mount the device on four-post racks.

Rack requirements consist of:

- Rack type
- Mounting bracket hole spacing
- Rack size and strength

- Rack connection to the building structure

Table 19 on page 35 provides the rack requirements and specifications.

Table 19: Rack Requirements and Specifications

Rack Requirement	Guidelines
Rack type	You can mount the device on a rack that provides bracket holes or hole patterns spaced at 1 U (1.75 in. or 4.45 cm) increments and meets the size and strength requirements to support the weight. A U is the standard rack unit defined by the Electronics Industry Association.
Mounting bracket hole spacing	The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.45 cm), so that the device can be mounted in any rack that provides holes spaced at that distance.
Rack size and strength	• Ensure that the rack complies with the size and strength standards of a 19-in. rack as defined by the Electronics Industry Association. • Ensure that the rack rails are spaced widely enough to accommodate the external dimensions of the device chassis. The outer edges of the front-mounting brackets extend the width of the chassis to 19 in. (48.2 cm). Space the front and rear rack rails between 23.5 in (59.7 cm) to 30.25 in (76.8 cm) front-to-back. • The rack must be strong enough to support the weight of the device. • Ensure that the spacing of rails and adjacent racks provides for proper clearance around the device and rack.
Rack connection to building structure	• Secure the rack to the building structure. • If earthquakes are a possibility in your geographical area, secure the rack to the floor. • Secure the rack to the ceiling brackets as well as wall or floor brackets for maximum stability.

Cabinet Requirements

You can mount the device in a cabinet that contains a 19-in. rack.

Cabinet Requirement	Guidelines
Cabinet size	• The minimum cabinet size is 36 in. (91.4 cm) deep. Large cabinets improve airflow and reduce chances of overheating.
Cabinet clearance	• The outer edges of the front mounting brackets extend the width of the chassis to 19 in. (48.2 cm). • The minimum total clearance inside the cabinet is 30.7 in. (78 cm) between the inside of the front door and the inside of the rear door.
Cabinet airflow requirements	When you mount the device in a cabinet, ensure that ventilation through the cabinet is sufficient to prevent overheating, as follows: • Ensure that there is adequate cool air supply to dissipate the thermal output of the device or devices. • Ensure that the hot air exhaust of the chassis exits the cabinet without recirculating into the device. An open cabinet (without a top or doors) that employs hot air exhaust extraction from the top ensures the best airflow through the chassis. If the cabinet contains a top or doors, perforations in these elements assist with removing the hot air exhaust. • Install the device in the cabinet in a way that maximizes the open space on the side of the chassis that has the hot air exhaust. • Route and secure all cables to minimize the blockage of airflow to and from the chassis. • Ensure that the spacing of rails and adjacent cabinets is such that proper clearance exists around the device and cabinet. • A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating.

SRX4600 Alarm and Management Cable Specifications and Pinouts

IN THIS SECTION

Management Cable Specifications

Table 20 on page 37 lists the specifications for the cables that connect the console and management ports to management devices.

Table 20: Specifications of Cables to Connect to Management Devices

Ports	Cable Specifications	Receptacle	Additional Information
RJ-45 Console port	Rollover cable	RJ-45	"Connect a Device to a Management Console Using an RJ-45 Connector" on page 55
Management Ethernet port	Ethernet cable with an RJ-45 connector	RJ-45	"Connect a Device to a Network for Out-of-Band Management" on page 57
Mini-USB Type-B Console port	Mini-USB cable with standard-A and Mini-USB Type-B (5-pin) connector	Mini-USB	

RJ-45 Management Port Connector Pinout Information

Table 21 on page 38 provides the pinout information for the RJ-45 connector for the management port on Juniper Networks devices.

Table 21: RJ-45 Management Port Connector Pinout Information

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1
2	TRP1-	Transmit/receive data pair 1
3	TRP2+	Transmit/receive data pair 2
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Console Port Connector Pinout Information

The console port on a Juniper Networks device is an RS-232 serial interface that uses an RJ-45 connector to connect to a console management device. The default baud rate for the console port is 9600 baud.

Table 22 on page 39 provides the pinout information for the RJ-45 console connector.

NOTE: We no longer include the RJ-45 console cable with the DB-9 adapter as part of the device package. If the console cable and adapter are not included in your device package, or if you need a different type of adapter, you can order the following separately:

- RJ-45 to DB-9 adapter (JNP-CBL-RJ45-DB9)
- RJ-45 to USB-A adapter (JNP-CBL-RJ45-USBA)
- RJ-45 to USB-C adapter (JNP-CBL-RJ45-USBC)

If you want to use RJ-45 to USB-A or RJ-45 to USB-C adapter you must have X64 (64-Bit) Virtual COM port (VCP) driver installed on your PC. See, https://ftdichip.com/drivers/vcp-drivers/ to download the driver.

NOTE: If your laptop or desktop PC does not have a DB-9 plug connector pin and you want to connect your laptop or desktop PC directly to a device, use a combination of the RJ-45-to-DB-9 socket adapter and a USB-to-DB-9 plug adapter. You must provide the USB-to-DB-9 plug adapter.

Table 22: Console Port Connector Pinout Information

Pin	Signal	Description
1	NC	No connect
2	NC	No connect
3	TxD Output	Transmit data
4	GND	Signal ground
5	GND	Signal ground
6	RxD Input	Receive data
7	DCD Input	Data carrier detect

Table 22: Console Port Connector Pinout Information *(Continued)*

Pin	Signal	Description
8	NC	No connect

RJ-45 to DB-9 Serial Port Adapter Pinout Information

The console port on a Juniper Networks device is an RS-232 serial interface that uses an RJ-45 connector to connect to a management device such as a laptop or a desktop PC. If your laptop or desktop PC does not have a DB-9 plug connector pin and you want to connect your laptop or desktop PC to the device, use a combination of the RJ-45 to DB-9 socket adapter along with a USB to DB-9 plug adapter.

Table 23 on page 40 provides the pinout information for the RJ-45 to DB-9 serial port adapter.

Table 23: RJ-45 to DB-9 Serial Port Adapter Pinout Information

RJ-45 pin	Signal	DB-9 pin	Signal
1	NC	8	CTS
2	NC	6	DSR
3	TxD	2	RxD
4	GND	5	GND
6	RxD	3	TxD
7	DCD	4	DTR
8	NC	7	RTS

RJ-45 Port, SFP Port, SFP+ Port, QSFP+ Port, and QSFP28 Port Connector Pinout Information

The tables in this topic describe the connector pinout information for the RJ-45, QSFP+, QSFP28, SFP+, and SFP ports.

Table 24: 10/100/1000BASE-T Ethernet Network Port Connector Pinout Information

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1 Negative Vport (in PoE models)
2	TRP1-	Transmit/receive data pair 1 Negative Vport (in PoE models)
3	TRP2+	Transmit/receive data pair 2 Positive Vport (in PoE models)
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2 Positive Vport (in PoE models)
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Table 25: SFP Network Port Connector Pinout Information

Pin	Signal	Description
1	VeeT	Module transmitter ground
2	TX_Fault	Module transmitter fault
3	TX_Disable	Transmitter disabled
4	SDA	2-wire serial interface data line
5	SCL-	2-wire serial interface clock
6	MOD_ABS	Module absent
7	RS	Rate select
8	RX_LOS	Receiver loss of signal indication
9	VeeR	Module receiver ground
10	VeeR	Module receiver ground
11	VeeR	Module receiver ground
12	RD-	Receiver inverted data output
13	RD+	Receiver noninverted data output
14	VeeR	Module receiver ground
15	VccR	Module receiver 3.3 V supply

Table 25: SFP Network Port Connector Pinout Information *(Continued)*

Pin	Signal	Description
16	VccT	Module transmitter 3.3 V supply
17	VeeT	Module transmitter ground
18	TD+	Transmitter noninverted data input
19	TD-	Transmitter inverted data input
20	VeeT	Module transmitter ground

Table 26: SFP+ Network Port Connector Pinout Information

Pin	Signal	Description
1	VeeT	Module transmitter ground
2	TX_Fault	Module transmitter fault
3	TX_Disable	Transmitter disabled
4	SDA	2-wire serial interface data line
5	SCL-	2-wire serial interface clock
6	MOD_ABS	Module absent
7	RS0	Rate select 0, optionally controls SFP+ module receiver
8	RX_LOS	Receiver loss of signal indication
9	RS1	Rate select 1, optionally controls SFP+ transmitter

Table 26: SFP+ Network Port Connector Pinout Information *(Continued)*

Pin	Signal	Description
10	VeeR	Module receiver ground
11	VeeR	Module receiver ground
12	RD-	Receiver inverted data output
13	RD+	Receiver noninverted data output
14	VeeR	Module receiver ground
15	VccR	Module receiver 3.3-V supply
16	VccT	Module transmitter 3.3-V supply
17	VeeT	Module transmitter ground
18	TD+	Transmitter noninverted data input
19	TD-	Transmitter inverted data input
20	VeeT	Module transmitter ground

Table 27: QSFP+ and QSFP28 Network Port Connector Pinout Information

Pin	Signal
1	GND
2	TX2n
3	TX2p

Table 27: QSFP+ and QSFP28 Network Port Connector Pinout Information *(Continued)*

Pin	Signal
4	GND
5	TX4n
6	TX4p
7	GND
8	ModSelL
9	LPMode_Reset
10	VccRx
11	SCL
12	SDA
13	GND
14	RX3p
15	RX3n
16	GND
17	RX1p
18	RX1n

Table 27: QSFP+ and QSFP28 Network Port Connector Pinout Information *(Continued)*

Pin	Signal
19	GND
20	GND
21	RX2n
22	RX2p
23	GND
24	RX4n
25	RX4p
26	GND
27	ModPrsL
28	IntL
29	VccTx
30	Vcc1
31	Reserved
32	GND
33	TX3p

Table 27: QSFP+ and QSFP28 Network Port Connector Pinout Information *(Continued)*

Pin	Signal
34	TX3n
35	GND
36	TX1p
37	TX1n
38	GND

CHAPTER 3

Initial Installation and Configuration

IN THIS CHAPTER

SRX4600 Firewall Installation Overview

To install and connect an SRX4600 Firewall:

1. Follow instructions in "Unpacking the SRX4600 Firewall" on page 50.
2. Mount the firewall by following instructions appropriate for your site:
   - "Mounting an SRX4600 Firewall on Four Posts of a Rack or Cabinet" on page 51
3. Connect the grounding cable as described in "Connecting Earth Ground to an SRX4600 Firewall" on page 59.
4. Follow instructions for connecting power as appropriate for your site. See:
   - "Connecting AC Power to an SRX4600 Firewall" on page 61
   - "Connecting DC Power to an SRX4600 Firewall" on page 63
5. Perform initial configuration by following the instructions in "Configuring the SRX4600 Firewall" on page 66.

RELATED DOCUMENTATION

SRX4600 Site Guidelines and Requirements | 29

SRX4600 Rack and Cabinet Requirements | 34

Unpacking the SRX4600

IN THIS SECTION

Unpacking the SRX4600 Firewall

The firewall is shipped in a cardboard carton, secured with foam packing material. The carton also contains an accessory box and quick-start instructions.

CAUTION: The firewall is maximally protected inside the cardboard carton. Do not unpack it until you are ready to begin installation.

To unpack the Firewall:

1. Move the cardboard carton to a staging area as close to the installation site as possible, where you have enough room to remove the components from the chassis.
2. Open the carton.
3. Pull out the packing material holding the firewall in place.
4. Verify the parts received against the inventory (packing list). The packing list specifies the part numbers and carries a brief description of each part in your order.
5. Save the shipping carton and packing materials in case you need to move or ship the firewall at a later time.

Verifying Parts Received with the SRX4600 Firewall

A packing list is included in each shipment. Check the parts in the shipment against the items on the packing list. The packing list specifies the part numbers and descriptions of each part in your order.

If any part on the packing list is missing, contact your customer service representative or contact Juniper customer care from within the U.S. or Canada by telephone at 1-888-314-5822. For international-dial or direct-dial options in countries without toll-free numbers, see https://www.juniper.net/support/requesting-support.html.

NOTE: The parts shipped with your firewall can vary depending on the configuration you ordered.

Table 28 on page 51 lists the parts and their quantities in the packing list.

Table 28: Parts List for a Fully Configured Firewall

Component	Quantity
Firewall	1
Power supply (preinstalled)	2 AC or DC
AC power cord appropriate for your geographical location (only for AC models)	2
Four-post rack mounting kit	1
End User License Agreement	1
Documentation Roadmap Card	1
Safety Guide	1
USB flash drive with Junos OS	1

Mounting an SRX4600 Firewall on Four Posts of a Rack or Cabinet

Before mounting the firewall on four posts of a rack:

- Verify that the site meets the requirements described in "Site Preparation Checklist for the SRX4600 Firewall" on page 28.
- Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read *General Safety Guidelines and Warnings*, with particular attention to *Chassis and Component Lifting Guidelines*.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- Six Phillips 4-40 flat-head mounting screws (provided with the four-post rack-mount kit)
- Eight Phillips 4x6-mm flat-head mounting screws (provided with the four-post rack-mount kit)
- One pair each of flush or 2-in.-recess front-mounting brackets
- One pair of side mounting rails
- One pair of rear mounting blades
- Screws to secure the chassis and the rear mounting blades to the rack (not provided)

You can mount an SRX4600 Firewall on four posts of a 19-in. rack or cabinet by using the four-post rack-mount kit. The remainder of this topic uses *rack* to mean *rack or cabinet*.

Space the front and rear rack rails between 23.5 in (59.7 cm) to 30.25 in (76.8 cm) front-to-back.

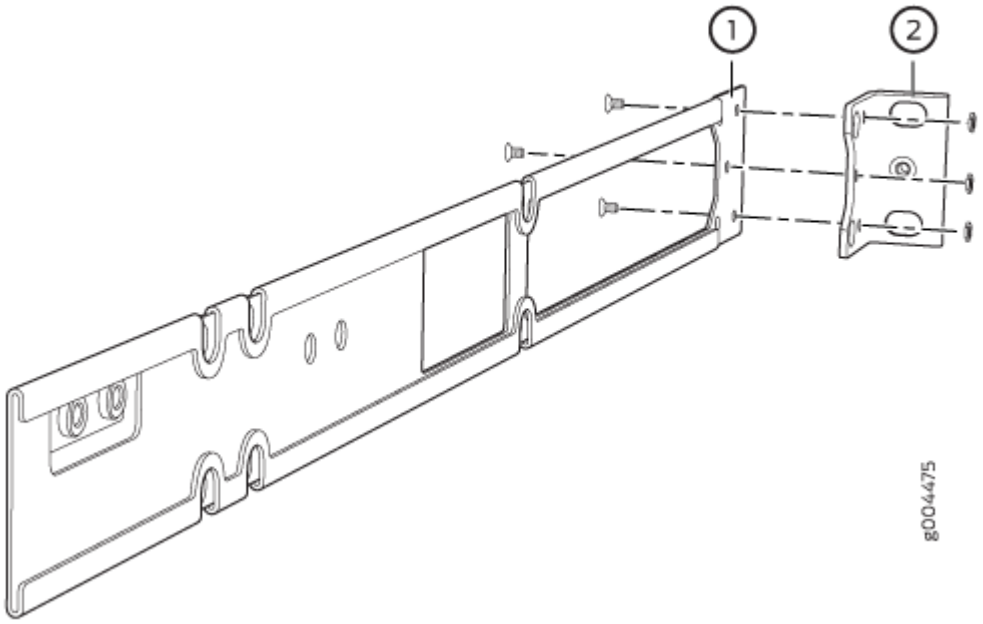
NOTE: One person must be available to lift the firewall while another secures it to the rack.

CAUTION: If you are mounting multiple units on a rack, mount the heaviest unit at the bottom of the rack and mount the other units from the bottom of the rack to the top in decreasing order of the weight of the units.

To mount the firewall on four posts of a rack:

1. Remove the firewall from the shipping carton (see "Unpacking the SRX4600 Firewall" on page 50).
2. Attach the front-mounting brackets (either the flush or the 2-in.-recess brackets) to the side mounting rails by using 6 Phillips 4-40 flat-head mounting screws. See Figure 21 on page 53.

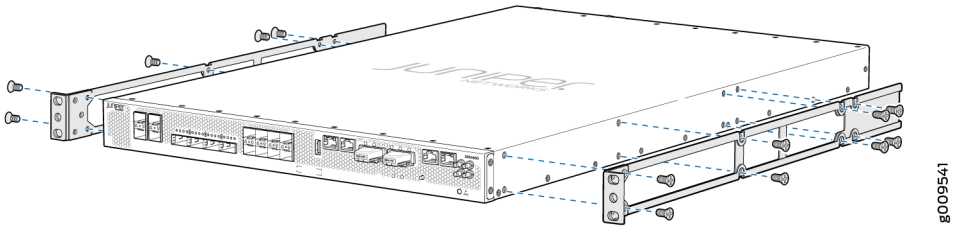
Figure 21: Attaching the Front-Mounting Bracket to the Side Mounting Rail



1– Side mounting rail	2– Front-mounting bracket

3. Place the firewall on a flat, stable surface.
4. Align the side mounting rails along the side panels of the firewall chassis. Align the two holes in the rear of the side mounting rails with the two holes on the rear of the side panel.
5. Insert the Phillips 4x6-mm flat-head mounting screws into the two aligned holes and tighten the screws. Ensure that the two holes in the rear of the side mounting rails are aligned with the remaining two holes in the side panel. See Figure 22 on page 53.

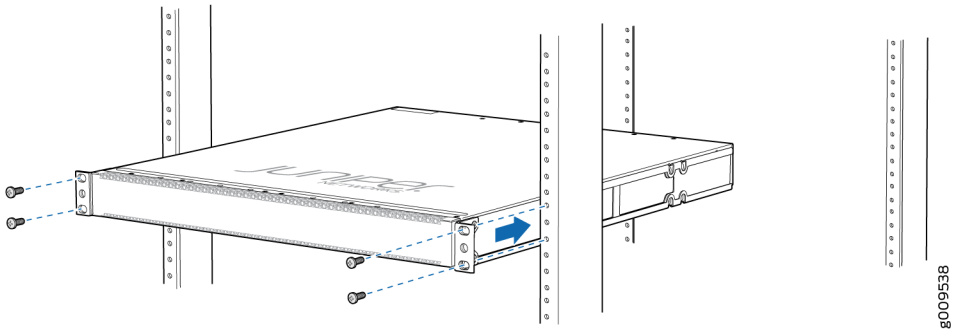
Figure 22: Attaching the Side Mounting-Rail to the Firewall Chassis



6. Insert the Phillips 4x6-mm flat-head mounting screws into the remaining two holes in the side mounting-rails and tighten the screws.

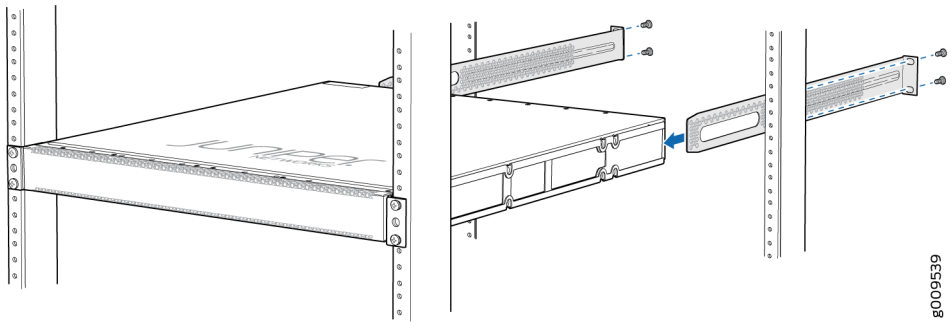
7. Have one person grasp both sides of the firewall, lift the firewall, and position it in the rack, aligning the side mounting rail holes with the threaded holes in the front post of the rack. Align the bottom hole in both the front-mounting brackets with a hole in each rack rail, making sure that the chassis is level. See Figure 23 on page 54.

Figure 23: Mounting the Firewall to the Front Posts of a Rack



8. Have a second person secure the front of the firewall to the rack by using the appropriate screws for your rack.
9. Slide the rear mounting blades into the side mounting rails. See Figure 24 on page 54.

Figure 24: Sliding the Rear Mounting-Blades into the Side Mounting Rail



10. Attach the rear mounting blades to the rear post by using the appropriate screws for your rack. Tighten the screws.
11. Ensure that the firewall chassis is level by verifying that all the screws on the front of the rack are aligned with the screws at the back of the rack.

RELATED DOCUMENTATION

Connecting the SRX4600 to External Devices | 55

Connecting the SRX4600 to Power | 59

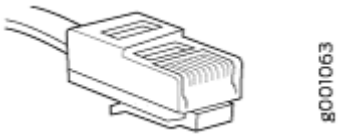
Connecting the SRX4600 to External Devices

IN THIS SECTION

Connect a Device to a Management Console Using an RJ-45 Connector

Ensure that you have an Ethernet cable that has an RJ-45 connector at either end and an RJ-45-to-DB-9 serial port adapter.

Figure 25: RJ-45 Connector on an Ethernet Cable



NOTE: We no longer include the RJ-45 console cable with the DB-9 adapter as part of the device package. If the console cable and adapter are not included in your device package, or if you need a different type of adapter, you can order the following separately:

- RJ-45 to DB-9 adapter (JNP-CBL-RJ45-DB9)
- RJ-45 to USB-A adapter (JNP-CBL-RJ45-USBA)

- RJ-45 to USB-C adapter (JNP-CBL-RJ45-USBC)

If you want to use RJ-45 to USB-A or RJ-45 to USB-C adapter, you must have X64 (64-Bit) Virtual COM port (VCP) driver installed on your PC. See https://ftdichip.com/drivers/vcp-drivers/ to download the driver.

NOTE: If your laptop or desktop PC does not have a DB-9 plug connector pin and you want to connect your laptop or desktop PC directly to the device, use a combination of the RJ-45-to-DB-9 socket adapter and a USB-to-DB-9 plug adapter. You must provide the USB-to-DB-9 plug adapter.

You can configure and manage your network devices using a dedicated management channel. Each device has a console port that you can connect to using an Ethernet cable with an RJ-45 connector. Use the console port to connect the device to the console server or management console. The console port accepts a cable that has an RJ-45 connector.

To connect the device to a management console:

1. Connect one end of the Ethernet cable to the console port (labeled **CON**, **CONSOLE**, or **CON1**) on the device.
2. Connect the other end of the Ethernet cable to the console server (see Figure 26 on page 56) or management console (see Figure 27 on page 56).

Figure 26: Connect a Device to a Management Console Through a Console Server

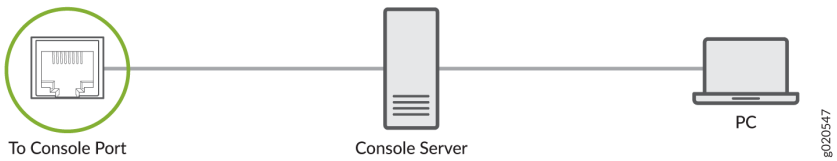
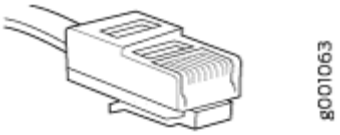


Figure 27: Connect a Device Directly to a Management Console

Connect a Device to a Network for Out-of-Band Management

Ensure that you have an Ethernet cable that has an RJ-45 connector at either end.

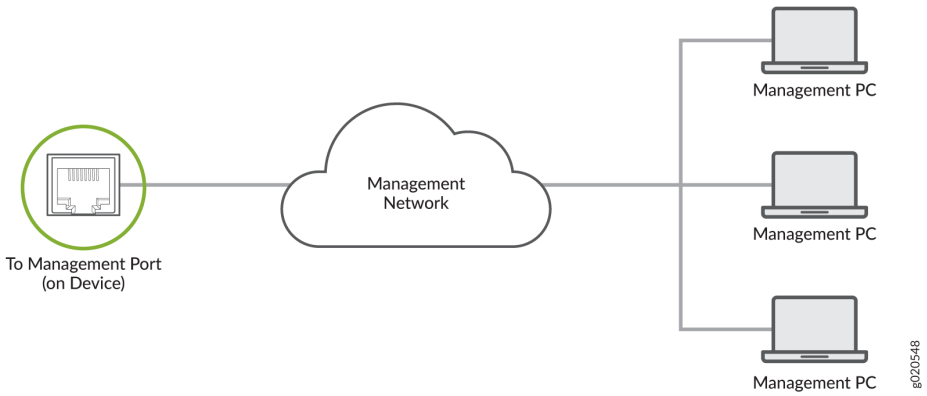
Figure 28: RJ-45 Connector on an Ethernet Cable



You can monitor and manage a network device, such as a router or a switch, by using a dedicated management channel. Each device has a management port to which you can connect an Ethernet cable with an RJ-45 connector. Use the management port to connect the device to the management device.

To connect a device to a network for out-of-band management:

1. Connect one end of the Ethernet cable to the management port on the device.
2. Connect the other end of the Ethernet cable to the management device.



Connecting an SRX4600 Firewall to a Management Console by Using the Mini-USB Type-B Console Port

Before you begin connecting the firewall by using the Mini-USB Type-B console port:

- Ensure that the USB to Serial driver is installed on the host machine. You can download the driver from https://webdownload.juniper.net/swdl/dl/secure/site/1/record/5029.html.

- Ensure that the HyperTerminal properties of the console server or laptop are set as follows:
  - Baud rate—9600
  - Flow control—None
  - Data—8
  - Parity—None
  - Stop bits—1
  - DCD state—Disregard

Ensure that you have the following parts and tools available:

- One mini-USB cable with Standard-A and Mini-USB Type-B (5-pin) connectors (not provided).

You can configure and manage an SRX4600 Firewall by using the RJ-45 console port or the Mini-USB Type-B console port.

If your laptop or PC does not have a DB-9 plug connector pin or RJ-45 connector pin, you can connect your laptop or PC directly to the firewall by using a mini-USB cable that has a Standard-A USB connector on one end and a Mini-USB Type-B (5-pin) connector on the other end.

This topic describes the procedure to connect an SRX4600 Firewall to the management console by using the Mini-USB Type-B console port.

For information about configuring and managing an SRX4600 Firewall by using the RJ-45 console port, see "Connect a Device to a Management Console Using an RJ-45 Connector" on page 55.

To connect the firewall to the console by using the Mini-USB Type-B console port:

1. Connect the Standard-A connector of the mini-USB cable to the host machine (PC or laptop).
2. Connect the Mini-USB Type-B (5-pin) connector of the mini-USB cable to the Mini-USB Type-B console port (labeled **CON**) on the firewall.
3. Set the Mini-USB Type-B console port as the active console port by using the `port-type` command.

   By default, the RJ-45 port is set as an active console port and the Mini-USB Type-B port is the passive console port. For information about configuring the console port type, see Configuring the Console Port Type (CLI Procedure).
4. Reboot the firewall.

After the connection is established, the Mini-USB Type-B becomes the active console port. The host machine connected to the Mini-USB Type-B console port displays log messages and enables you to control firewall functionality through it.

SEE ALSO

Configuring the SRX4600 Firewall | 66

Connecting the SRX4600 to Power

IN THIS SECTION

Connecting Earth Ground to an SRX4600 Firewall

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the SRX4600 Firewall to earth ground before you connect it to power.

For installations that require a separate grounding conductor to the chassis, you must attach a protective earthing terminal bracket on the mounting bracket on the left front of the firewall to connect to the earth ground).

You must install the SRX4600 in a restricted-access location and ensure that the chassis is always properly grounded. The SRX4600 has a two-hole protective grounding terminal provided on the chassis. See Figure 29 on page 61. Under all circumstances, use this grounding connection to ground the chassis. For AC-powered systems, you must also use the grounding wire in the AC power cord along with the two-hole grounding lug connection. This tested system meets or exceeds all applicable EMC regulatory requirements with the two-hole protective grounding terminal.

Before you connect earth ground to the protective earthing terminal of an SRX4600 Firewall, ensure that a licensed electrician has attached an appropriate grounding lug to the grounding cable.

CAUTION: Using a grounding cable with an incorrectly attached lug can damage the firewall.

NOTE: Mount your firewall in the rack or cabinet before attaching the grounding lug to the firewall. See "SRX4600 Firewall Installation Overview" on page 49.

Ensure that you have the following parts and tools available:

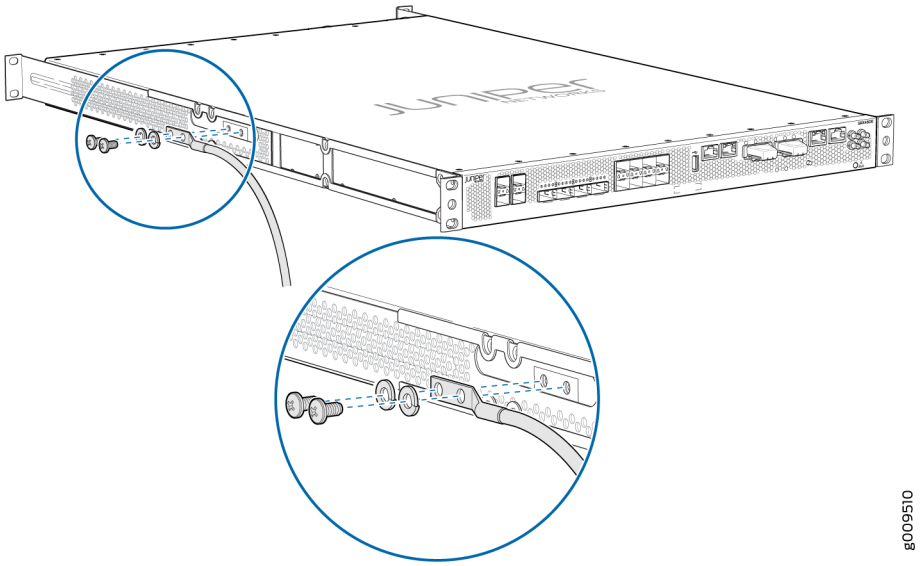
- Protective earthing terminal bracket (not provided)—This bracket attaches to the firewall chassis through the left front mounting bracket, providing a protective earthing terminal for the firewall.
- Grounding cable for your firewall (not provided)—The grounding cable must be 14 AWG (2 mm^2), minimum 90° C wire, or as permitted by the local code.
- Grounding lug for your grounding cable (not provided)—The grounding lug required is a Panduit LCD10-10A-L or equivalent.
- Two SAE 10–32 x 0.375 in. screws with integrated split washers (not provided)—The screws and washers are used to secure the grounding lug to the protective earthing terminal.
- Socket wrench or screw driver to tighten the screws.

An AC-powered firewall chassis gains additional grounding when you plug the power supply in the firewall into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. See "SRX4600 Firewall AC Power Cord Specifications" on page 24.

To connect earth ground to an SRX4600 Firewall:

1. Connect one end of the grounding cable to an appropriate earth ground site, such as the mounting rack.
2. Position the grounding lug over the protective earthing terminal on the side of the chassis, which is visible through the mounting bracket.
3. Secure the grounding lug to the protective earthing terminal with the two washers and screws. See Figure 29 on page 61.

Figure 29: Connecting a Grounding Cable to an SRX4600 Firewall



4. Dress the grounding cable and ensure that it does not touch or block access to other device components and that it does not drape where people could trip over it.

Connecting AC Power to an SRX4600 Firewall

Ensure that you have a power cord appropriate for your geographical location available to connect AC power to the firewall.

Before you begin connecting AC power to the firewall:

- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see *Prevention of Electrostatic Discharge Damage*).
- Ensure that you have connected the firewall chassis to earth ground.

> **CAUTION**: Before you connect power to the firewall, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the firewall (for example, by causing a short circuit).
>
> To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the chassis to earth ground before you connect it to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the firewall chassis to connect to the earth

ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an SRX4600 Firewall" on page 59. The firewall gains additional grounding when you plug the power supply in the firewall into a grounded AC power outlet by using the AC power cord appropriate for your geographical location.

- Install the power supply in the chassis. For instructions on installing an AC power supply in an SRX4600 Firewall, see "Installing the SRX4600 Firewall AC Power Supply" on page 77.

The SRX4600 Firewall is shipped from the factory with two power supplies. Each power supply is a field-replaceable unit (FRU). You can install replacement power supplies without powering off the firewall or disrupting the firewall function.

NOTE: Each power supply must be connected to a dedicated power source outlet.

To connect AC power to an SRX4600 Firewall:

1. Attach the grounding strap to your bare wrist and to a site ESD point.
2. Ensure that the power supplies are fully inserted in the chassis and the latches are secure. If only one power supply is installed, ensure a that blank cover panel is installed over the second power supply slot.
3. Locate the power cord or cords shipped with the firewall; the cords have plugs appropriate for your geographical location. See "SRX4600 Firewall AC Power Cord Specifications" on page 24.

   WARNING: Ensure that the power cord does not block access to device components or drape where people can trip on it.

4. Insert the coupler end of the power cord into the power cord inlet that is on the faceplate of the AC power supply.
5. Push the power cord retainer onto the power cord.
6. Insert the power cord plug into an AC power source outlet.
   - If the AC power source outlet has a power switch, set it to on (|) position and the firewall will power on.
   - If there is no power switch on the AC power source outlet, the firewall will power on instantly.
7. Verify that the LEDs on each power supply are lit green.

   If the amber fault LED is lit, remove power from the power supply, and replace the power supply (see "Replacing an SRX4600 Firewall AC Power Supply" on page 77). Do not remove the power supply until you have a replacement power supply ready: the power supplies or a blank cover panel must be installed in the firewall to ensure proper airflow.

CAUTION: Replace a failed power supply with a blank panel or new power supply within 1 minute of removal to prevent chassis overheating.

Connecting DC Power to an SRX4600 Firewall

Before you begin connecting DC power to the firewall:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see *Prevention of Electrostatic Discharge Damage*).
- Ensure that you have connected the firewall chassis to earth ground.

CAUTION: To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the firewall to earth ground before you connect it to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the firewall chassis to connect to earth ground. For instructions on connecting an SRX4600 Firewall to ground using a separate grounding conductor, see "Connecting Earth Ground to an SRX4600 Firewall" on page 59.

- Install the power supply in the chassis. See "Installing the SRX4600 Firewall DC Power Supply" on page 80.

Ensure that you have the following parts and tools available to connect DC power to the firewall:

- Electrostatic discharge (ESD) grounding strap
- Multimeter

The SRX4600 Firewall is shipped from the factory with two power supplies. Each power supply is a field-replaceable unit (FRU). You can install replacement power supplies without powering off the firewall or disrupting the firewall function.

WARNING: Before you perform DC power procedures, ensure there is no power to the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off position, and tape the switch handle of the circuit breaker in the off position.

CAUTION: Before you connect power to the firewall, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the firewall (for example, by causing a short circuit).

NOTE: Each power supply input feed must be connected to a dedicated DC power source outlet.

WARNING: Ensure that the power cords do not block access to firewall components or drape where people can trip on them.

To connect DC power to the firewall:

1. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Ensure that the power source circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads do not become active while you are connecting DC power.
3. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify the resistance of the **–48V** and **RTN** DC cables to chassis ground:
   - The cable with very high resistance (indicating an open circuit) to chassis ground is negative (–) and will be installed on the **–48V** (input) DC power input terminal.
   - The cable with very low resistance (indicating a closed circuit) to chassis ground is positive (+) and will be installed on the **RTN** (return) DC power input terminal.

   CAUTION: You must ensure that power connections maintain the proper polarity. The power source cables might be labeled **(+)** and **(–)** to indicate their polarity. There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the power cables that attach to the DC power input terminals on each power supply.
4. Install heat-shrink tubing insulation around the power cables.

   To install heat-shrink tubing:

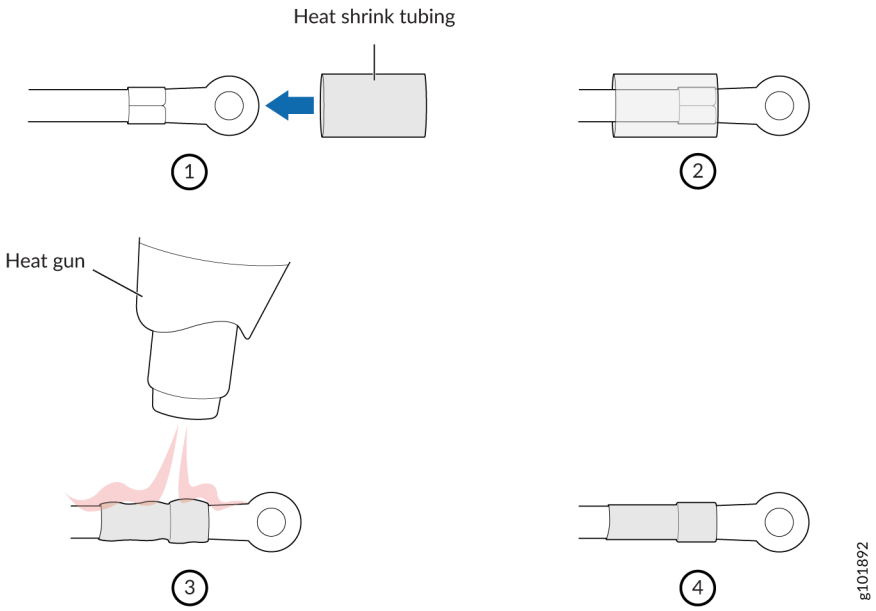
   a. Slide the tubing over the portion of the cable where it is attached to the lug barrel. Ensure that tubing covers the end of the wire and the barrel of the lug attached to it.

b. Shrink the tubing with a heat gun. Ensure that you heat all sides of the tubing evenly so that it shrinks around the cable tightly.

Figure 30 on page 65 shows the steps to install heat-shrink tubing.

NOTE: Do not overheat the tubing.

Figure 30: How to Install Heat-Shrink Tubing

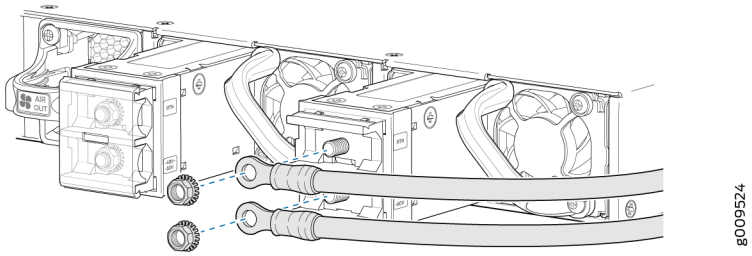


5. Remove the protective cover from the DC power input terminal block. Save this cover for future use.

NOTE: It might be necessary to slide each power supply partially out of the chassis to easily connect the DC power source cables to the DC power input terminals. See "Removing the SRX4600 Firewall DC Power Supply" on page 80.

6. Remove the M5 K-nuts from each DC power input terminal.
7. Attach DC terminal rings (TE 2-36161-2 Terminal Ring, number 10 or equivalent, provided) to the ends of the DC power source cables (not provided). Crimp tightly.
8. Insert the DC terminal rings into the DC power input terminals and secure the DC terminal rings with M5 K-nuts, (see Figure 31 on page 66). Apply between 9 lb-in. (1.1 Nm) and 12 lb-in. (1.3 Nm) of torque to tighten each M5 K-nuts.

Figure 31: Connecting the Power Supply Cables to a DC power Supply



9. Replace the protective cover over the input terminal block.
10. Ensure that the power supply is fully inserted and latched securely in the chassis.
11. Repeat Steps 5 through step 10 for any remaining power supply.
12. Remove the tape from the switch handle of the circuit breaker on the panel board that services the DC circuit, and switch the circuit breaker to the ON (|) position.
13. Verify that the OK/FAIL LED is lit green and on steadily.

RELATED DOCUMENTATION

SRX4600 Power System | 18

Configuring the SRX4600 Firewall

You must perform the initial configuration of the device through the console port.

Before you begin, set the following parameter values in the console server or the management host:

- Baud rate—9600
- Flow control—None
- Data—8
- Parity—None
- Stop bits—1
- DCD state—Disregard

To configure the device from the console:

1. Connect the console port (**CON**), located on the front panel of the firewall to a laptop or PC by using the RJ-45 cable and RJ-45 to DB-9 serial port adapter.
2. Log in as the root user. There is no password.

```
login: root
```

3. Start the CLI:

```
root# cli
root@>
```

4. Enter configuration mode

```
root@> configure
Entering configuration mode

[edit]
root@#
```

5. Set the root authentication password by entering either a cleartext password, an encrypted password, or an SSH public key string (DSA or RSA):

```
[edit]
root@# set system root-authentication plain-text-password
New password: password
Retype new password: password
```

6. Configure an administrator account on the device. When prompted, enter the password for the administrator account:

```
[edit]
root@# set system login user admin class super-user authentication plain-text-password
New password: password
Retype new password: password
```

7. Commit the configuration to activate it on the device.

```
[edit]
root@# commit
```

8. Log in as the administrative user you configured in Step 6.
9. (Optional) Configure the name of the device. If the name includes spaces, enclose the name in quotation marks (“ ”):

```
[edit]
admin@# set system host-name host-name
```

10. Configure the IP address and prefix length for the management interface on the device:

```
[edit]
admin@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

11. Configure the default route:

```
[edit]
admin@# set routing-options static route 0.0.0.0/0 next-hop gateway
```

12. Check the configuration for validity:

```
[edit]
admin@# commit check
```

13. Commit the configuration to activate it on the device:

```
[edit]
admin@# commit
```

14. When you have finished configuring the device, exit configuration mode:

```
[edit]
admin@# exit
```

RELATED DOCUMENTATION

Connecting the SRX4600 to External Devices | 55

4

CHAPTER

Maintaining Components

IN THIS CHAPTER

Routine Maintenance Procedures for the SRX4600 Firewall

IN THIS SECTION

Purpose

For optimum firewall performance, perform preventive maintenance procedures regularly.

Action

- Inspect the installation site for moisture, loose wires or cables, and excessive dust.
- Make sure that airflow is unobstructed around the device and into the air intake vents.
- Check the status-reporting components on the front panel of the device—system alarms and LEDs.
- Periodically inspect the site to ensure that the grounding and power cables connected to the firewall are securely in place.

RELATED DOCUMENTATION

Maintaining the SRX4600 Cooling System | 71

Maintaining the SRX4600 Power System | 75

Maintaining the SRX4600 SSD | 85

Maintaining the SRX4600 Cables and Connectors | 96

Maintaining the SRX4600 Cooling System

IN THIS SECTION

Maintaining the Fan Modules on the SRX4600 Firewall

IN THIS SECTION

Purpose

For optimum cooling, verify the condition of the fan modules.

Action

- Monitor the status of the fan modules. All the fan modules work in unison to cool the firewall. If one fan module fails, the redundant fan module acts as a backup. A major alarm is triggered when a fan fails, and a minor alarm and major alarm is triggered when a fan module is removed. We recommend that you replace the fan module immediately to maintain proper cooling.
- To display the status of the cooling system, issue the `show chassis environment` command. The output shown below is an example.

```
user@host> show chassis environment
Class Item                  Status     Measurement
      Routing Engine 0 CPU           Testing
      Routing Engine 1 CPU           Absent
```

```
      FPC 0 Exhaust Right Sensor     OK          43 degrees C / 109 degrees F
      FPC 0 Glacis FPGA Die Temp     OK          41 degrees C / 105 degrees F
      FPC 0 Intake Right Sensor      OK          32 degrees C / 89 degrees F
      FPC 0 Intake left Sensor       OK          31 degrees C / 87 degrees F
      FPC 0 Middle Sensor - 0        OK          36 degrees C / 96 degrees F
      FPC 0 Middle Sensor - 1        OK          36 degrees C / 96 degrees F
      FPC 0 Intake Sensor on Mezz board OK       27 degrees C / 80 degrees F
      FPC 0 CPU0 Die Temp Sensor     OK          56 degrees C / 132 degrees F
      FPC 0 CPU1 Die Temp Sensor     OK          78 degrees C / 172 degrees F
      FPC 1 Ambient Intake Sensor    OK          26 degrees C / 78 degrees F
      FPC 1 XR1 Sensor               OK          39 degrees C / 102 degrees F
      FPC 1 EA ASIC Sensor           OK          48 degrees C / 118 degrees F
      FPC 1 Exhaust Sensor           OK          40 degrees C / 104 degrees F
      FPC 1 Exhaust External Sensor  OK          38 degrees C / 100 degrees F
      FPC 1 XR0 Sensor               OK          36 degrees C / 96 degrees F
Power Power Supply 0                 OK          41 degrees C / 105 degrees F
      Power Supply 1                 OK          36 degrees C / 96 degrees F
Fans  Fan Tray 0 Fan 0               OK          Spinning at normal speed
      Fan Tray 0 Fan 1               OK          Spinning at normal speed
      Fan Tray 1 Fan 0               OK          Spinning at normal speed
      Fan Tray 1 Fan 1               OK          Spinning at normal speed
      Fan Tray 2 Fan 0               OK          Spinning at normal speed
      Fan Tray 2 Fan 1               OK          Spinning at normal speed
      Fan Tray 3 Fan 0               OK          Spinning at normal speed
      Fan Tray 3 Fan 1               OK          Spinning at normal speed
      Fan Tray 4 Fan 0               OK          Spinning at normal speed
      Fan Tray 4 Fan 1               OK          Spinning at normal speed
```

NOTE: The fan module numbers **0** to **4** are labeled on the sheet metal of firewall.

Replacing the SRX4600 Firewall Fan Module

IN THIS SECTION

Each fan module is a field-replaceable unit (FRU) installed in the rear panel of the SRX4600 Firewall. You can remove and replace the fan modules without powering off the firewall or disrupting firewall functions.

NOTE: All the fan modules must be installed and operational for optimal functioning of the firewall.

Removing the SRX4600 Firewall Fan Module

Ensure that you have the following tools and parts available:

- Phillips (+) screwdriver, number 1
- An antistatic bag or an antistatic mat
- A replacement fan module
- Electrostatic discharge (ESD) grounding strap

You can remove a fan module without powering off the firewall or disrupting firewall functions.

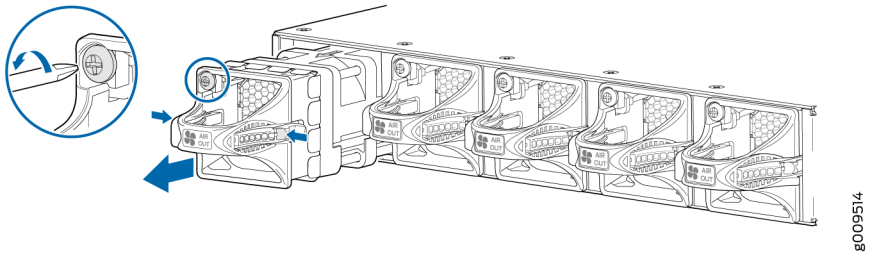
NOTE: Once you remove the faulty fan module, make sure you install a working fan module within two minutes.

To remove the fan module (see Figure 1):

1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
2. Place the antistatic bag or the antistatic mat on a flat, stable surface.
3. Loosen the captive screw on the front faceplate of the fan module by using the screwdriver.

   WARNING: To prevent injury, do not touch the fan with your hands or any tools as you slide the fan module out of the chassis—the fan might still be running.
4. Grasp the handle on the fan module and pull it firmly to slide the fan module out of the chassis.
5. Place the fan module in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

Figure 32: Removing a Fan Module



Installing the SRX4600 Firewall Fan Module

Ensure that you have the following tools and parts available:

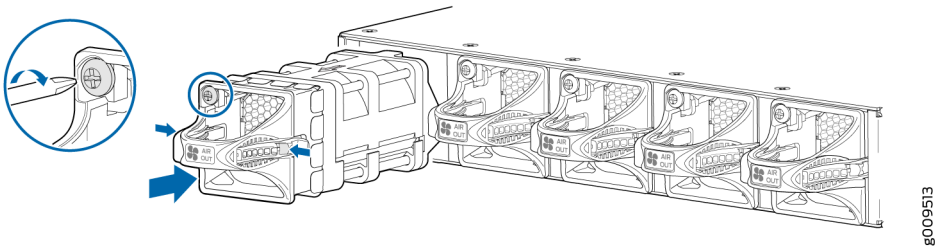
- ESD grounding strap
- Phillips (+) screwdriver, number 1

You can install a fan module without powering off the firewall or disrupting firewall functions.

To install the fan module, see (Figure 2):

1. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Remove the fan module from its bag.
3. Hold the handle of the fan module with one hand and support the weight of the module with the other hand. Place the fan module in the fan module slot on the rear panel of the firewall and slide it in until it is fully seated.
4. Tighten the captive screws on the faceplate of the fan module by using the screwdriver.

Figure 33: Installing a Fan Module



NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/support/tools/updateinstallbase/ . Failure to do so can result in significant delays if you need replacement parts. This note does not apply if you replace existing components with the same type of component.

RELATED DOCUMENTATION

Understanding the SRX4600 Firewall Cooling System and Air Flow | 15

Maintaining the SRX4600 Power System

IN THIS SECTION

Maintaining SRX4600 Firewall Power Supplies

IN THIS SECTION

Purpose

For optimum firewall performance, verify the condition of the power supplies.

Action

On a regular basis:

- To check the status of the power supplies, issue the `show chassis environment pem` command. The output shown below is an example.

```
user@host> show chassis environment pem
PEM 0 status:
  State                      Online
  Airflow                    Front to Back
  Temperature                OK   45 degrees C / 113 degrees F
  Temperature                OK   39 degrees C / 102 degrees F
  Temperature                OK   28 degrees C / 82 degrees F
  Firmware version           04.10
  Fan 0                      9232 RPM
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12.00     16            192      6
PEM 1 status:
  State                      Online
  Airflow                    Front to Back
  Temperature                OK   42 degrees C / 107 degrees F
  Temperature                OK   35 degrees C / 95 degrees F
  Temperature                OK   26 degrees C / 78 degrees F
  Firmware version           04.10
  Fan 0                      8896 RPM
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12.00     18            216      7
```

- Make sure that the power and grounding cables are arranged so that they do not obstruct access to other firewall components.
- Routinely check the status LEDs on the power supply faceplates to determine whether the power supplies are functioning normally. Each power supply faceplate displays a single LED to indicate the status of the power supply.
- Check the alarm LEDs on the front panel of the device. Power supply failure or removal triggers an alarm that causes one or both of the LEDs to light. You can display the associated error messages by issuing the following command:

```
user@host> show chassis alarms
```

- Periodically inspect the site to ensure that the grounding and power cables connected to the device are securely in place and that there is no moisture accumulating near the device.

Replacing an SRX4600 Firewall AC Power Supply

IN THIS SECTION

Each power supply is a field-replaceable unit (FRU) installed in the rear panel of the SRX4600 Firewall. You can remove and replace a power supply without powering off the firewall or disrupting firewall functions.

NOTE: All the power supplies must be installed and operational for optimal functioning of the firewall.

Removing the SRX4600 Firewall AC Power Supply

Ensure that you have the following tools and parts available:

- Electrostatic discharge (ESD) grounding strap
- An antistatic bag or an antistatic mat
- Phillips (+) screwdriver, number 1
- A cover panel for the power supply slot

You can remove an AC power supply without powering off the firewall or disrupting firewall functions.

NOTE: Before you remove a power supply from the firewall, ensure that you have taken the necessary precautions to prevent ESD damage (see Prevention of Electrostatic Discharge Damage).

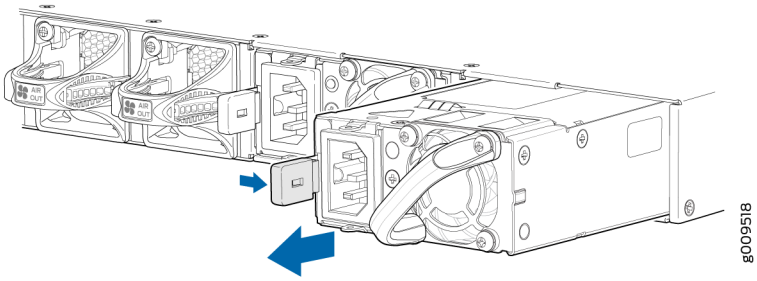
CAUTION: We recommend that you install either a replacement power supply or a cover panel in the empty power supply slot to prevent chassis overheating and dust accumulation.

NOTE: After powering off a power supply, wait at least 60 seconds before turning it back on.

To remove an AC power supply, see (Figure 1):

1. If the AC power source outlet has a power switch, set it to the off (**O**) position. Follow the instructions for your site.
2. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
3. Place the antistatic bag or the antistatic mat on a flat, stable surface.
4. Gently pull out the plug end of the power cord connected to the power source outlet.
5. Remove the power cord from the power supply faceplate by detaching the power cord retainer and gently pulling out the socket end of the power cord connected to the power supply faceplate.
6. Slide the release latch to the left to unseat the power supply from the chassis. See Figure 1.
7. Grasp the power supply handle and pull firmly to slide the power supply halfway out of the chassis.
8. Place one hand under the power supply to support it and slide it completely out of the chassis. Take care not to touch power supply components, pins, leads, or solder connections.
9. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.
10. If you are not replacing the power supply, install the cover panel over the slot.

Figure 34: Removing an AC Power Supply



Installing the SRX4600 Firewall AC Power Supply

Ensure that you have the following tools and parts available:

- ESD grounding strap
- Phillips (+) screwdriver, number 1

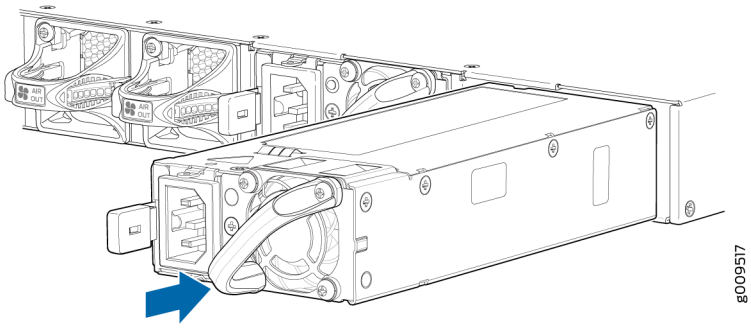
You can install an AC Power Supply without powering off the firewall or disrupting firewall functions.

NOTE: Before you install a power supply from the firewall, ensure that you have taken the necessary precautions to prevent ESD damage (see Prevention of Electrostatic Discharge Damage).

To install the AC power supply, see (Figure 2):

1. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Taking care not to touch power supply pins, leads, or solder connections, remove the power supply from the bag.
3. Using both hands, place the power supply in the power supply slot on the rear panel of the firewall and slide it in until it is fully seated and slide the release latch to the right.
4. Insert the socket end of the power cord into the faceplate of the power supply and attach the power cord retainer.
5. Insert the plug end of the power cord to the power source outlet.
6. On the AC power source outlet, set the power switch to on (I) position. Follow the instructions for your site.
7. Observe the status LED on the power supply faceplate. If the power supply is correctly installed and functioning normally, the status LED glows green steadily.

Figure 35: Installing an AC Power Supply



NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/support/tools/updateinstallbase/ . Failure to do so can result in significant delays if you need replacement parts. This note does not apply if you replace existing components with the same type of component.

Replacing an SRX4600 Firewall DC Power Supply

IN THIS SECTION

Each power supply is a field-replaceable unit (FRU) installed in the rear panel of the SRX4600 Firewall. You can remove and replace a power supply without powering off the firewall or disrupting firewall functions.

NOTE: All the power supplies must be installed and operational for optimal functioning of the firewall.

Removing the SRX4600 Firewall DC Power Supply

Ensure that you have the following tools and parts available:

- Electrostatic discharge (ESD) grounding strap
- An antistatic bag or an antistatic mat
- Socket nut driver
- A cover panel for the power supply slot

You can remove a DC power supply without powering off the firewall or disrupting firewall functions.

NOTE: Before you remove a power supply from the firewall, ensure that you have taken the necessary precautions to prevent ESD damage (see Prevention of Electrostatic Discharge Damage).

WARNING: Before performing DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off (O) position, and tape the switch handle of the circuit breaker in the off position.

CAUTION: We recommend that you install either a replacement power supply or a cover panel in the empty power supply slot to prevent chassis overheating and dust accumulation.

NOTE: After powering off a power supply, wait at least 60 seconds before turning it back on.

To remove a DC power supply, see Figure 4

1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
2. Place the antistatic bag or the antistatic mat on a flat, stable surface.
3. Make sure that the voltage across the DC power source cables leads is 0 V and that there is no chance that the cables might become active during the removal process.
4. Remove the protective cover from the input terminals. Save the protective cover for later use.
5. Using the socket nut driver remove the M5 K-nuts from each of the DC power terminals. See Figure 3.
6. Remove the cable lugs from the input DC terminals and carefully move the power cables out of the way.
7. Replace the protective cover onto the input terminals.
8. Slide the latch lock to allow the retention latch of the power supply to disengage from the chassis slots.
9. Grasp the power supply handle and pull firmly to slide the power supply halfway out of the chassis.
10. Place one hand under the power supply to support it. Grasp the power supply handle with your other hand and pull the power supply completely out of the chassis.
11. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.
12. If you are not immediately replacing the power supply, install the cover panel over the slot.

Figure 36: Removing the DC Power Cables

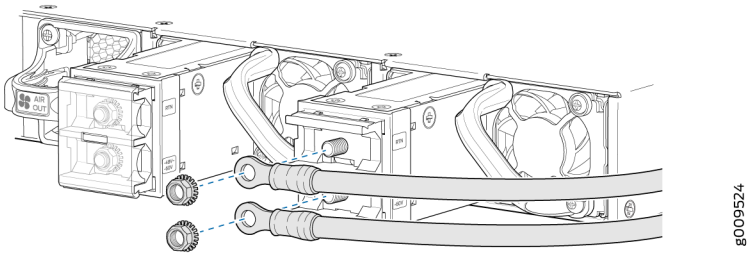
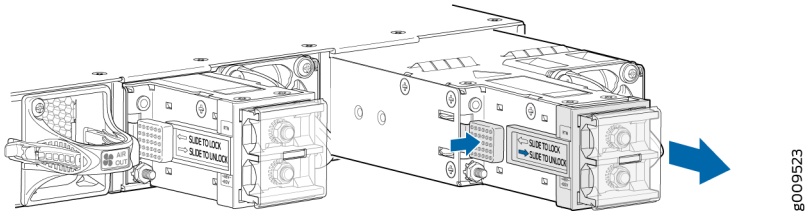


Figure 37: Removing a DC Power Supply



Installing the SRX4600 Firewall DC Power Supply

Ensure that you have the following tools and parts available:

- ESD grounding strap
- An antistatic bag or an antistatic mat
- Socket nut driver

You can install an DC Power Supply without powering off the firewall or disrupting firewall functions.

NOTE: Before you remove a power supply from the firewall, ensure that you have taken the necessary precautions to prevent ESD damage (see Prevention of Electrostatic Discharge Damage).

WARNING: Before performing DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off (O) position, and tape the switch handle of the circuit breaker in the off position.

To install the DC power supply, see (Figure 5):

1. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Make sure that the voltage across the DC power source cables leads is 0 V and that there is no chance that the cables might become active during the removal process.
3. Using both hands, place the power supply in the power supply slot on the rear panel of the firewall and slide it half way through.
4. Slide the latch lock to allow the retention latch of the power supply to move freely.
5. Silde the power supply completely into the chassis until it is fully seated and the retention latch is engaged into chassis slots.
6. Slide the latch lock to the right to prevent the retention latch from rotating. The power supply is now locked into the chassis.
7. Remove the protective cover from the input terminals. Save the protective cover for later use.
8. Using the socket nut driver remove the M5 K-nuts from each of the DC power terminals.
9. Secure each power cable lug to the terminal with the M5 K-nuts (see Figure 6). Apply between 5 lb-in. (0.6 Nm) and 6 lb-in. (0.7 Nm) of torque to the nut. Do not overtighten the nut (use a socket nutdriver).
   a. Secure the positive (+) DC source power cable lug to the **RTN** (return) terminal.
   b. Secure the negative (–) DC source power cable lug to the **–48V - 60V** (input) terminal.

   ⚠ **CAUTION**: CAUTION: Ensure that each power cable lug seats flush against the surface of the terminal block as you are tightening the socket nuts. Ensure that each socket nut is properly threaded into the terminal. Applying installation torque to the socket nut when improperly threaded might result in damage to the terminal.

   ⚠ **CAUTION**: You must ensure that power connections maintain proper polarity. The power source cables might be labeled (+) and (–) to indicate their polarity. There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the power cables that attach to the terminal studs on each power supply.
10. Verify that the power cabling is correct, that the cables do not touch or block access to firewall components, and that they do not drape where people could trip on them.
11. Replace the protective cover onto the input terminals.
12. Attach the power cable to the DC power source, and switch on the dedicated customer-site circuit breaker. Follow the instructions for your site.
13. Observe the status LED on the power supply faceplate. If the power supply is correctly installed and functioning normally, the status LED glows green steadily.

Figure 38: Installing a DC Power Supply

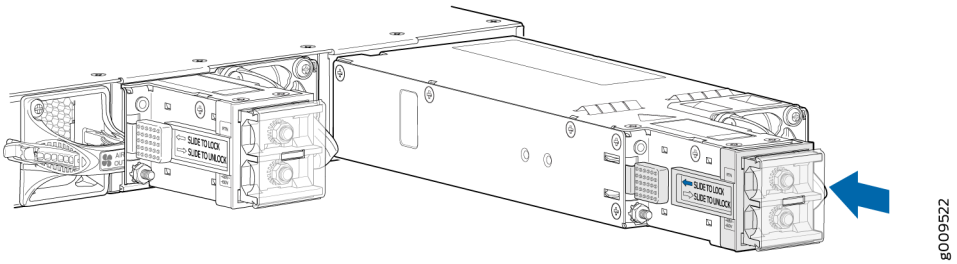
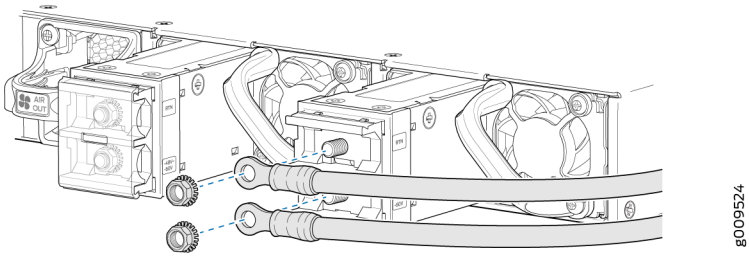


Figure 39: Connecting the DC Power Cables



NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/support/tools/updateinstallbase/ . Failure to do so can result in significant delays if you need replacement parts. This note does not apply if you replace existing components with the same type of component.

RELATED DOCUMENTATION

Connecting the SRX4600 to Power | 59

Maintaining the SRX4600 SSD

IN THIS SECTION

Replacing an SRX4600 Firewall SSD

IN THIS SECTION

This topic explains how to replace an Solid State-Drive (SSD) if RAID (Redundant Array of Independent Disks) is not configured on your SRX4600 Firewall.

The two SSDs installed in the SRX4600 Firewall are field-replaceable unit (FRUs). You need to power off the SRX4600 Firewall to replace a SSD from the firewall.

When you are replacing a faulty SSD with a new SSD that has no Junos OS installed on it or if you have to reinstall the corrupted Junos OS image on the SSD, you should use a USB flash drive to install the Junos OS.

Removing an SSD from an SRX4600 Firewall

Ensure that you have the following equipment available:

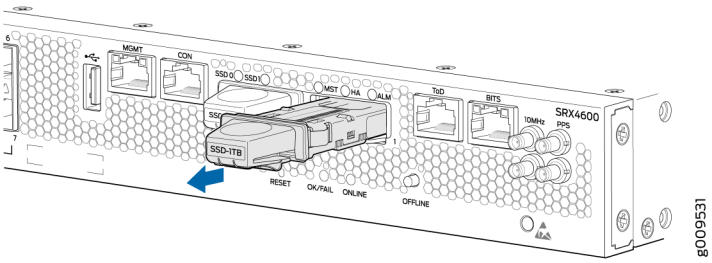
- Electrostatic discharge (ESD) grounding strap
- An antistatic bag or an antistatic mat
- SSD to replace

You need to power off the SRX4600 Firewall to remove a SSD from the firewall.

To remove an SSD, see (Figure 1):

1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
2. Place the antistatic bag or the antistatic mat on a flat, stable surface.
3. Place your thumb on the SSD handle and press the tab below the SSD handle with one finger to unlock the SSD from its slot.
4. Pull the SSD firmly to slide it out of its slot.
5. Place the SSD in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

Figure 40: Removing an SSD



Installing an SSD in an SRX4600 Firewall

Ensure that you have the following equipment available:

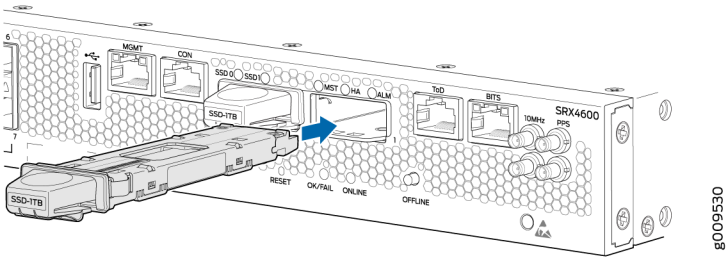
- ESD grounding strap

You need to power off the SRX4600 Firewall to install a SSD into the firewall.

To install an SSD, see (Figure 41 on page 87):

1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
2. Hold the SSD by its handle and slide it gently into its slot until the tab below the handle locks into the SSD slot.
3. Follow the procedure in "Creating a Bootable USB Flash Drive to Install Junos OS on an SRX4600 Firewall" on page 87 if the new SSD has no Junos OS installed on it.

Figure 41: Installing the SSD



Creating a Bootable USB Flash Drive to Install Junos OS on an SRX4600 Firewall

IN THIS SECTION

If Junos OS on the SRX4600 Firewall is damaged or if you are replacing a solid state-drive (SSD) that has no Junos OS installed on it, you can use a bootable USB flash drive to install Junos OS on the SSD.

This topic provides information on how to create a bootable USB flash drive and install Junos OS image on an SRX4600 Firewall.

Creating a Bootable USB Flash-Drive

You can create a bootable disk using any procedure listed below:

Before creating a bootable USB flash-drive, you must have the following items:

- 3 GB (or larger) USB flash-drive (formatted with a FAT 32 file system)
- Junos OS image file

Example of the Install media:

```
junos-install-media-usb-srxhe-x86-64-17.4R1-S1.9.img.gz
```

NOTE: As the Junos OS image for USB flash-drive is in .gz compressed format, you must decompress the file before writing it onto the USB flash-drive.

WARNING: When you create a bootable USB flash-drive, the contents of the USB flash-drive are deleted.

Creating a Bootable USB Flash Drive using an SRX High-end Device

To create a bootable USB flash-drive using an SRX High-end device:

1. Connect to any SRX High-end device that has enough storage (approx. 3GB), through a console.
2. Copy the Junos OS image to the **/var/tmp** directory of the SRX High-end device.

   In the example below, the junos install media is copied onto an SRX5800 Firewall:

```
user@srx5800% cd /var/tmp/
user@srx5800% ls -lrt *srxhe*
-rw-r--r--  1 root  wheel  2147483648 Jan  8 16:56 junos-install-media-usb-srxhe-
x86-64-17.4R1-S1.9.img
```

3. Insert a USB flash drive into the USB port of the SRX High-end device and check if the USB flash drive is recognized.

   For Example:

```
user@srx5800% umass0: Generic Mass Storage, rev 2.00/1.00, addr 3
da0 at umass-sim0 bus 0 target 0 lun 0
da0: Generic Flash Disk 8.07 Removable Direct Access SCSI-4 device
da0: 40.000MB/s transfers
da0: 15200MB (31129600 512 byte sectors: 255H 63S/T 1937C)
```

4. Configure the USB flash drive as a boot disk using the `dd` commands:

a. To check if the system can read and write the USB flash drive, erase the initial sectors of the USB flash drive using the command `dd if=/dev/zero of=/dev/<Device Name> count=<n>` . For example: Device Name= the device name given to the USB flsh drive (da0) and n = number of blocks.

```
user@srx5800% dd if=/dev/zero of=/dev/da0 count=20
20+0 records in
20+0 records out
10240 bytes transferred in 0.016966 secs (603556 bytes/sec)
```

b. Copy the install-media image to the USB flash drive using the command `dd if=<LOCATION>/<junos-install-media> of=/dev/<Device Name> bs=<n>m` . For example: LOCATION = Locally where Junos OS image is stored (/var/tmp/), junos-install-media = Junos OS install media image, Device Name = the device name given to the USB flsh drive (da0), bs = block size, and n = number of blocks.

```
user@srx5800% dd if=/var/tmp/junos-install-media-usb-srxhe-x86-64-17.4R1-S1.9.img
of=/dev/da0 bs=16m
128+0 records in
128+0 records out
2147483648 bytes transferred in 271.689162 secs (7904193 bytes/sec)
```

5. Remove the USB flash drive.

```
user@srx5800% umass0: at uhub1 port 1 (addr 3) disconnected
(da0:umass-sim0:0:0:0): lost device
(da0:umass-sim0:0:0:0): removing device entry
umass0: detached
```

The USB flash-drive is now ready to use as a bootable disk.

Creating a Bootable USB Flash Drive using an SRX4600 Firewall

To create a bootable USB flash-drive using an SRX4600 Firewall:

1. Connect to any SRX4600 Firewall that has enough storage (approx. 3GB), through a console and login with root credentials.
2. Copy the Junos OS install image to the **/var/tmp** directory of the SRX4600 Firewall.
3. Copy the install-media to hypervisor using the statement `scp`

Example:

```
root@SRX4600:~ # scp -JU __juniper_private4__
/var/tmp/junos-install-media-usb-srxhe-x86-64-17.4R1-S1.9.img root@192.168.1.1:/var/tmp
```

4. Insert a USB flash drive into the USB port of SRX4600 Firewall.

5. Enter hypervisor using the command `vhclient -s` and check the image under **/var/tmp/**

```
root@ SRX4600:~ # vhclient -s
Last login: Sat Feb  3 01:32:07 UTC 2018 from summit1ru-vpnqa05 on pts/0
You have new mail.

root@ SRX4600:/var/tmp# ls -lrt *usb*
-rw-r--r-- 1 root root 2147483648 Feb  3 01:31 junos-install-media-usb-srxhe-x86-64-17.4R1-
S1.9.img
```

6. Check if the USB flash drive is recognized.

```
root@ SRX4600:/var/tmp# lsscsi
[4:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sda
[5:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sdb
[6:0:0:0]    disk             USB DISK 2.0     PMAP  /dev/sdc
```

The USB flash drive name is *sdc*

7. Configure the USB flash drive as a boot disk using the `dd` commands:

   a. To check if the system can read and write the USB flash drive, erase the initial sectors of the USB flash drive using the command `dd if=/dev/zero of=/dev/<Device Name> count=<n>` . For example: Device Name = the device name given to the USB flsh drive (sdc) and n = number of blocks.

```
root@ SRX4600-node -node: /var/tmp# dd if=/dev/zero
of=/dev/sdc count=20
20+0 records in
20+0 records out
10240 bytes (10 kB) copied, 0.0156234 s, 655 kB/s
```

   b. Copy the install-media image to the USB flash drive using the command `dd if=<LOCATION>/<junos-install-media> of=/dev/<Device Name> bs=<n>m` . For example: LOCATION = Locally where Junos OS

image is stored (/var/tmp/), junos-install-media = Junos OS install media image, Device Name = the node name given to the USB flsh drive (da0), bs = block size and n = number of blocks.

```
root@ SRX4600-node: /var/tmp# dd if=junos-install-media-usb-srxhe-x86-64-17.4R1-S1.9.img
of=/dev/sdc bs=16M
128+0 records in
128+0 records out
2147483648 bytes (2.1 GB) copied, 618.131 s, 3.5 MB/s
```

c. Exit from the hypervisor.

```
root@ SRX4600-node:/var/tmp# exit
logout
rlogin: connection closed

root@ SRX4600:~ #
```

8. Remove the USB flash drive.

The USB flash-drive is now ready to use as a bootable disk.

Creating a Bootable USB Flash Drive using a using a Windows Device

To create a bootable USB flash-drive using using a Windows Device:

1. Install Win32 Disk Imager on your laptop or computer. You can download it from https://sourceforge.net/projects/win32diskimager/ .
2. Download the required Junos OS image from the Downloads page to the **Documents** directory of your laptop or computer.
3. Insert a USB flash drive into the USB port of your laptop or computer.
4. Open the win32diskimager application and in the *Image File* box type the path to the **Documents** directory or click the folder icon to navigate to the **Documents** directory and select the install media image.
5. Under *Device*, select the USB flash-drive and click *Write* and *Confirm*.
6. The *Progress* box shows the progress. Remove the USB flash drive once it is complete.

The USB flash-drive is now ready to use as a bootable disk.

Creating a Bootable USB Flash Drive using a MAC OS X Device

To create a bootable USB flash-drive using a MAC OS X device:

1. Copy the install media (.img format) to the **/var/tmp/** directory of the MAC OS X device using the statement `scp` .
2. Run the `diskutil list` command to get the list of devices on the MAC OS X device.
3. Insert the USB flash-drive into the USB port of the MAC OS X device.
4. Run the `diskutil list` command again to determine the device node assigned to USB flash-drive (e.g. /dev/disk2).
5. Run the `diskutil unmountDisk /dev/diskN` command (replace N with the disk number from the last command - in the previous example, N would be 2)
6. Execute sudo **dd if=/var/tmp/junos-install-media-usb-srxhe-x86-64-17.4R1-S1.9.img of=/dev/rdiskN bs=1m**

   NOTE: Using `/dev/rdisk` instead of `/dev/disk` may be faster.

   NOTE: If you see the error `dd: Invalid number '1m'`, you are using `GNU dd`. Use the same command but replace `bs=1m` with `bs=1M`.

   NOTE: If you see the error `dd: /dev/diskN: Resource busy`, make sure the disk is not in use. Start the 'Disk Utility.app' and unmount (don't eject) the USB flash-drive.
7. Run the command `diskutil eject /dev/diskN`.

Installing Junos OS on SRX4600 Firewall Using the Bootable USB Flash-Drive

Before installing Junos OS using a bootable USB flash-drive, you must first complete the steps in "Creating a Bootable USB Flash-Drive" on page 87 .

1. Insert the USB flash drive into the USB port of the SRX4600 Firewall.
2. Connect to the SRX4600 Firewall through a console.
3. Power cycle (off/on) the SRX4600 Firewall and `Press Esc for boot options`.
4. Select `Boot Manager` and press Enter key.

5. From the `Boot Option Menu`, select USB flash drive and press Enter key.
6. In the `GRUB Menu` select "`Install Juniper Linux with secure boot support`" and press Enter key.
7. Once prompted "`Remove the USB and press [Entre] key to Reboot...`", remove the USB flash drive and press Enter key. SRX4600 Firewall will reboot with new software.

Copying Files From or To an SRX4600 Firewall Using an USB Flash-Drive

IN THIS SECTION

This topic explains how to copy files from or to an SRX4600 Firewall using an USB flash-drive.

Copying Files From an SRX4600 Firewall Using an USB Flash-Drive

This procedure explains how to copy files from an SRX4600 Firewall to an USB flash-drive.

1. Connect to SRX4600 Firewall through a console and login with root credentials.
2. Insert the USB flash drive (Formatted with FAT32 file system) into the SRX4600 USB port.
3. Enter into hypervisor by using the `vhclient -s` command.

```
root@srx4600:/var/tmp # vhclient -s
Last login: Wed Nov  1 16:49:41 UTC 2017 from srx4600 on pts/0
You have new mail.

root@srx4600-node:~#
```

4. Using the `lsscsi` command check if the USB flash-drive is being recognized.

```
root@srx4600-node:~# lsscsi
[4:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sda
```

```
[5:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sdb
[6:0:0:0]    disk    UFD 3.0  Silicon-Power8G  1100  /dev/sdc
```

5. Mount the USB flash-drive.

```
root@srx4600-node:~# mkdir /var/tmp/usb
root@srx4600-node:~# mount /dev/sdc1 /var/tmp/usb
```

6. Go back to Junos prompt by using the `exit` command.

```
root@srx4600-node:~# exit
 root@srx4600:/var/tmp #
```

7. Use the command `ls -lrt` to list the files located at **/var/tmp**.

```
root@srx4600:/var/tmp # ls -lrt
-rw-r--r--  1 root  wheel  1226057800 Nov  1 14:20 File1.txt
```

File1.txt is the file located in **/var/tmp**

8. Copy the required file to the USB flash-drive as shown in the example below.

   In the example below File1.txt is copied to the USB flash-drive:

```
root@srx4600:/var/tmp # scp -JU __juniper_private4__
File1.txt root@192.168.1.1:/var/tmp/usb/
File1.txt  100% 1169MB  30.0MB/s   00:39
root@srx4600:/var/tmp #
```

9. Go back to hypervisor.

```
root@srx4600:/var/tmp # vhclient -s
Last login: Wed Nov  1 16:56:32 UTC 2017 from srx4600 on pts/0
       You have new mail.

root@srx4600-node:~#
```

10. Unmount the USB flash-drive and exit hypervisor.

```
root@srx4600-node:~# umount /var/tmp/usb
root@srx4600-node:~# exit
root@srx4600-node:~#
```

11. Remove the USB flash-drive.

Copying Files To an SRX4600 Firewall Using an USB Flash-Drive

This procedure explains how to copy files from USB flash drive to a SRX4600 firewall **/var/tmp/** folder.

1. Connect to SRX4600 Firewall through a console and login with root credentials.
2. Insert the USB flash drive (Formatted with FAT32 file system) into the SRX4600 USB port.
3. Enter into hypervisor by using the `vhclient -s` command.

```
root@srx4600:/var/tmp # vhclient -s
Last login: Wed Nov  1 16:49:41 UTC 2017 from srx4600 on pts/0
You have new mail.

root@srx4600-node:~#
```

4. Using the `lsscsi` command check if the USB flash-drive is being recognized.

```
root@srx4600-node:~# lsscsi
[4:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sda
[5:0:0:0]    disk    ATA      TS960GV8MD1YTJM  O122  /dev/sdb
[6:0:0:0]    disk    UFD 3.0  Silicon-Power8G  1100  /dev/sdc
```

5. Mount the USB flash-drive.

```
root@srx4600-node:~# mkdir /var/tmp/usb
root@srx4600-node:~# mount /dev/sdc1 /var/tmp/usb
```

6. Go back to Junos prompt by using the `exit` command.

```
root@srx4600-node:~# exit
 root@srx4600:/var/tmp #
```

7. Copy the required file from USB flash drive to SRX4600 Firewall as shown in the example below.

   In the example below File2.txt is copied to the SRX4600 Firewall **/var/tmp/** folder:

```
root@srx4600:/var/tmp # scp -JU __juniper_private4__
root@192.168.1.1:/var/tmp/usb/File2.txt /var/tmp/
```

8. Go back to hypervisor.

```
root@srx4600:/var/tmp # vhclient -s
Last login: Wed Nov  1 16:56:32 UTC 2017 from srx4600 on pts/0
       You have new mail.

root@srx4600-node:~#
```

9. Unmount the USB flash-drive and exit hypervisor.

```
root@srx4600-node:~# umount /var/tmp/usb
root@srx4600-node:~# exit
root@srx4600-node:~#
```

10. Remove the USB flash-drive.

Maintaining the SRX4600 Cables and Connectors

IN THIS SECTION

Maintaining SRX4600 Firewall Network Cables

IN THIS SECTION

Purpose

For optimum firewall performance, verify the condition of the network cables.

Action

On a regular basis:

- Secure excess cable in tidy loops that do not obstruct access to the firewall. Do not allow fastened loops of cable to dangle from the connector, because this stresses the cable at the fastening point. Putting fasteners on the loops helps maintain their shape.
- Keep the cable connections clean and free of dust and other particles, which can cause drops in the received power level. Always inspect cables and clean them if necessary before connecting an interface.
- Label both ends of the cables to identify them.

SEE ALSO

Routine Maintenance Procedures for the SRX4600 Firewall | **70**

How to Handle Fiber-Optic Cables

Fiber-optic cables connect to optical transceivers that are installed in Juniper Networks devices.

Follow these guidelines when handling fiber-optic cables:

- When you unplug a fiber-optic cable from a transceiver, place rubber safety caps over the transceiver and on the end of the cable.
- Anchor fiber-optic cables to prevent stress on the connectors. When attaching a fiber-optic cable to a transceiver, be sure to secure the fiber-optic cable so that it does not support its own weight as it hangs to the floor. Never let a fiber-optic cable hang free from the connector.
- Avoid bending the fiber-optic cables beyond their minimum bend radius. Bending fiber-optic cables into arcs smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.
- Frequent plugging and unplugging of fiber-optic cables in and out of optical instruments can damage the instruments, which are expensive to repair. To prevent damage from overuse, attach a short fiber extension to the optical equipment. The short fiber extension absorbs wear and tear due to frequent plugging and unplugging. Replacing the short fiber extension is easier and cost efficient compared with replacing the instruments.
- Keep fiber-optic cable connections clean. Microdeposits of oil and dust in the canal of the transceiver or cable connector can cause loss of light, reduction in signal power, and possibly intermittent problems with the optical connection.
  - To clean the transceiver canal, use an appropriate fiber-cleaning device such as RIFOCS Fiber Optic Adaptor Cleaning Wands (part number 946). Follow the instructions in the cleaning kit you use.
  - After cleaning the transceiver, make sure that the connector tip of the fiber-optic cable is clean. Use only an approved alcohol-free fiber-optic cable cleaning kit such as the Opptex Cletop-S®Fiber Cleaner. Follow the instructions in the cleaning kit you use.

Replacing Fibre Optic Cable on an SRX4600 Firewall

IN THIS SECTION

Disconnect a Fiber-Optic Cable

Before you disconnect a fiber-optic cable from an optical transceiver, ensure that you have taken the necessary precautions for safe handling of lasers. See *Laser and LED Safety Guidelines and Warnings*.

Ensure that you have the following parts and tools available:

- A rubber safety cap to cover the transceiver
- A rubber safety cap to cover the fiber-optic cable connector

Juniper Networks devices have optical transceivers to which you can connect fiber-optic cables.

To disconnect a fiber-optic cable from an optical transceiver installed in the device:

1. Disable the port in which the transceiver is installed by issuing the following command:

```
[edit interfaces]
user@device# set interface-name disable
```

> **LASER WARNING**: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

2. Carefully unplug the fiber-optic cable connector from the transceiver.
3. Cover the transceiver with a rubber safety cap.

> **LASER WARNING**: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and protects your eyes from accidental exposure to laser light.

4. Cover the fiber-optic cable connector with the rubber safety cap.

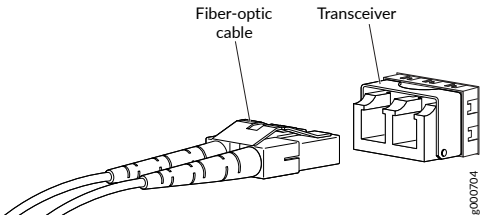
Connect a Fiber-Optic Cable

Before you connect a fiber-optic cable to an optical transceiver installed in a device, ensure that you have taken the necessary precautions for safe handling of lasers (see Laser and LED Safety Guidelines and Warnings).

To connect a fiber-optic cable to an optical transceiver installed in a device:

LASER WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

1. If the fiber-optic cable connector is covered with a rubber safety cap, remove the cap. Save the cap.
2. Remove the rubber safety cap from the optical transceiver. Save the cap.
3. Insert the cable connector into the optical transceiver.



4. Secure the cables so that they do not support their own weight. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on a loop helps cables maintain their shape.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

Do not let fiber-optic cables hang free from the connector. Do not allow fastened loops of cables to dangle, which stresses the cables at the fastening point.

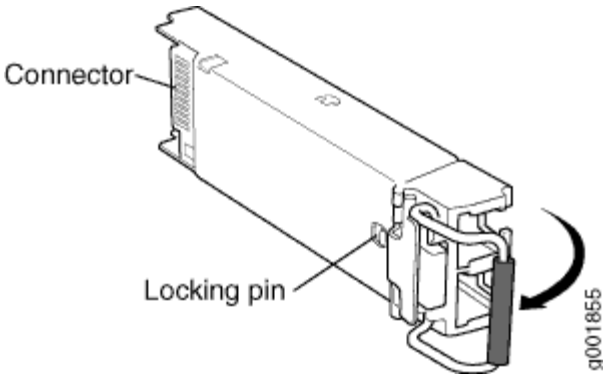
Replacing an SFP+ Transceiver on an SRX4600 Firewall

IN THIS SECTION

Small form-factor pluggable plus transceivers (SFP+) are enhanced SFP transceivers that provides support for data rates of up to 10 Gbps for fiber-optic or copper interfaces. SFP+ transceivers are hot-

removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the device or disrupting device functions.

Figure 42: Small Form-Factor Pluggable (SFP) Transceiver



Removing an SFP+ Transceiver

To remove an SFP+ transceiver:

1. Have ready a replacement transceiver or a transceiver slot plug, an antistatic mat, and a rubber safety cap for the transceiver.
2. Attach an ESD grounding strap to your bare wrist, and connect the other end of the strap to an ESD grounding point.
3. Label the cables connected to the transceiver so that you can reconnect them correctly later.
4. Remove the cable connector from the transceiver. Immediately cover the transceiver and the end of the cable with a rubber safety cap.

   LASER WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to a transceiver emit laser light that can damage your eyes.

5. Pull the ejector handle out from the transceiver to unlock the transceiver.

   CAUTION: Make sure that you open the ejector handle completely until you hear it click. This prevents damage to the transceiver.

   Use needlenose pliers to pull the ejector handle out from the transceiver.
6. Grasp the transceiver ejector handle, and pull the transceiver approximately 0.5 in. (1.3 cm) out of the interface port.

7. Using your fingers, grasp the body of the transceiver, and pull it the rest of the way out of the interface port.
8. Place a rubber safety cap over the transceiver.
9. Place the removed transceiver on an antistatic mat or in an electrostatic bag.

CAUTION: After removing a transceiver from the chassis, wait at least 30 seconds before reinserting it or inserting a transceiver into a different slot.

SEE ALSO

No Link Title

Installing an SFP+ Transceiver

To install an SFP+ transceiver:

1. Attach an ESD grounding strap to your bare wrist, and connect the other end of the strap to an ESD grounding point.
2. Take each transceiver to be installed out of its electrostatic bag, and identify the slot on the component where it will be installed.
3. Verify that each transceiver is covered by a rubber safety cap. If it is not, cover the transceiver with a safety cap.
4. Carefully align the transceiver with the slots in the component. The connectors should face the component.
5. Slide the transceiver until the connector is seated in the component slot. If you are unable to fully insert the transceiver, make sure the connector is facing the right way.
6. Close the ejector handle of the transceiver.
7. Remove the rubber safety cap from the transceiver and the end of the cable. Insert the cable into the transceiver.

LASER WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to a transceiver emit laser light that can damage your eyes.

SEE ALSO

No Link Title

Replacing a QSFP28 Transceiver on an SRX4600 Firewall

IN THIS SECTION

28-Gbps quad small form-factor pluggable (QSFP28) transceivers are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the device or disrupting device functions.

Remove a QSFP28 Transceiver

Before you remove a transceiver from a device, ensure that you have taken the necessary precautions for safe handling of lasers (see *Laser and LED Safety Guidelines and Warnings*).

Ensure that you have the following parts and tools available:

- An antistatic bag or an antistatic mat
- Rubber safety caps to cover the transceiver and fiber-optic cable connector
- A dust cover to cover the port or a replacement transceiver

The transceivers for Juniper Networks devices are hot-removable and hot-insertable field-replaceable units (FRUs). You can remove and replace the transceivers without powering off the device or disrupting the device functions.

NOTE: After you insert a transceiver, or after you change the media-type configuration, wait for 6 seconds for the interface to display operational commands.

NOTE: We recommend that you use only optical transceivers and optical connectors purchased from Juniper Networks with your Juniper Networks device.

To remove a QSFP28 transceiver (see Figure 2):

1. Place an antistatic bag or antistatic mat on a flat, stable surface to receive the QSFP28 transceiver. Have a rubber safety cap ready for the QSFP28 transceiver and the cable.

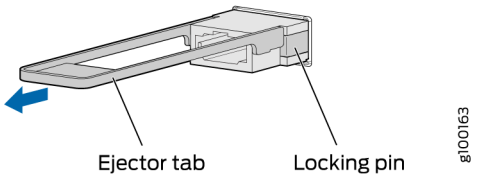
2. Wrap and fasten one end of an ESD wrist strap around your bare wrist, and connect the other end of the strap to the ESD point on the switch.
3. Label the cable connected to the QSFP28 transceiver so that you can later reconnect it to the correct QSFP28 transceiver.
4. Disconnect the cable from the transceiver. Immediately cover the transceiver and the end of the cable with a rubber safety cap.

> **CAUTION**: Do not leave a fiber-optic transceiver uncovered, except when inserting or removing a cable. The safety cap keeps the port clean and protects your eyes from accidental exposure to laser light.

5. If there is a cable management system, arrange the cable in the cable management system to prevent it from dislodging or developing stress points. Secure the cable so that it does not support its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop in the cable management system. Placing fasteners on the loop helps to maintain its shape.

> **CAUTION**: Do not bend the fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.

Figure 43: Remove a QSFP28 Transceiver



6. Pull the ejector tab straight back. The locking pins on the transceiver automatically release the transceiver.
7. Place the transceiver on the antistatic mat or in the antistatic bag.
8. Place the dust cover over the empty port, or install the replacement transceiver.

Install a QSFP28 Transceiver

Before you install a transceiver in a device, ensure that you have taken the necessary precautions for safe handling of lasers (see *Laser and LED Safety Guidelines and Warnings*).

Ensure that you have a rubber safety cap available to cover the transceiver.

The transceivers for Juniper Networks devices are hot-removable and hot-insertable field-replaceable units (FRUs). You can remove and replace the transceivers without powering off the device or disrupting the device functions.

NOTE: After you insert a transceiver or after you change the media-type configuration, wait for 6 seconds for the interface to display operational commands.

NOTE: We recommend that you use only optical transceivers and optical connectors purchased from Juniper Networks with your Juniper Networks device.

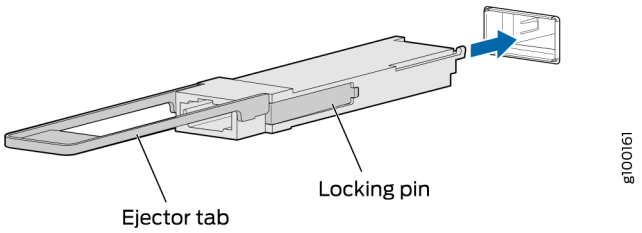
CAUTION: The Juniper Networks Technical Assistance Center (JTAC) provides complete support for Juniper-supplied optical modules and cables. However, JTAC does not provide support for third-party optical modules and cables that are not qualified or supplied by Juniper Networks. If you face a problem running a Juniper device that uses third-party optical modules or cables, JTAC may help you diagnose host-related issues if the observed issue is not, in the opinion of JTAC, related to the use of the third-party optical modules or cables. Your JTAC engineer will likely request that you check the third-party optical module or cable and, if required, replace it with an equivalent Juniper-qualified component.

Use of third-party optical modules with high-power consumption (for example, coherent ZR or ZR+) can potentially cause thermal damage to or reduce the lifespan of the host equipment. Any damage to the host equipment due to the use of third-party optical modules or cables is the users' responsibility. Juniper Networks will accept no liability for any damage caused due to such use.

To install a QSFP28 transceiver (see Figure 3):

1. Wrap and fasten one end of an ESD wrist strap around your bare wrist, and connect the other end of the strap to the ESD point on the switch.
2. Verify that a rubber safety cap covers the QSFP28 transceiver.
3. Position the transceiver in front of the port on the device so that the QSFP28 connector faces the port.

Figure 44: Install a QSFP28 Transceiver



4. Slide the transceiver into the port until the locking pins lock in place. If there is resistance, remove the transceiver and flip it so that the connector faces the other direction.
5. Remove the rubber safety cap from the transceiver and the end of the cable, and insert the cable into the transceiver.

> **LASER WARNING**: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cable connected to a transceiver emit laser light that can damage your eyes.

> **CAUTION**: Do not leave a fiber-optic transceiver uncovered except when inserting or removing cable. The safety cap keeps the port clean and protects your eyes from accidental exposure to laser light.

6. If there is a cable management system, arrange the cable in the cable management system to prevent the cable from dislodging or developing stress points. Secure the cable so that it does not support its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop in the cable management system. Placing fasteners on the loop helps to maintain its shape.

> **CAUTION**: Do not let fiber-optic cable hang free from the connector. Do not allow fastened loops of cable to dangle, which stresses the cable at the fastening point.

> **CAUTION**: Avoid bending fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.

CHAPTER 5

Troubleshooting Hardware

IN THIS CHAPTER

Troubleshooting the SRX4600

IN THIS SECTION

SRX4600 Firewall Troubleshooting Resources

To troubleshoot a firewall, use the Junos OS command-line interface (CLI) and LEDs on the chassis:

- LEDs—When the firewall detects an alarm condition, the status LED on the front panel glows red.
- CLI—The CLI is the primary tool for controlling and troubleshooting hardware, Junos OS, and network connectivity. Use the CLI to display more information about alarms. CLI commands display information about network connectivity derived from the ping and traceroute utilities. For information about using the CLI to troubleshoot Junos OS, see the appropriate Junos OS configuration guide.
- JTAC—If you need assistance during troubleshooting, you can contact the Juniper Networks Technical Assistance Center (JTAC) by using the Web or by telephone. If you encounter software problems, or problems with hardware components not discussed here, contact JTAC.

Chassis Component Alarm Conditions on an SRX4600 Firewall

You can monitor chassis alarms through the **ALM** LED. When the firewall detects an alarm condition, the **ALM** LED on the front panel glows and the level of severity can be either major (steady red), or minor (yellow) or both major and minor (blinking red). To view a more detailed description of the alarm cause, issue the `show chassis alarms` and `show system alarm` commands.

Table 29 on page 109 describes alarms that can occur for the firewall chassis component.

Table 29: Alarms for Firewall Chassis Components

Component	Alarm Conditions	Action	Alarm Severity
Fan	At least one of the fans have failed.	• Check and adjust the room temperature, if possible. • Check the air flow and ensure that the airflow through the firewall is unobstructed. • Replace the failed fan module to avoid failure of the other fan modules. • Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Steady red (major)
	The firewall chassis temperature is too warm.	• Check the room temperature. • Check the air flow. • Run all the Fans at full speed. • Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Yellow (minor)/Red (major)

Table 29: Alarms for Firewall Chassis Components *(Continued)*

Component	Alarm Conditions	Action	Alarm Severity
	Missing fan module	Install the missing fan module.	Red (major)
	Fan over-speeding	• Check if the fan is spinning more than the configured speed. • Replace the fan module as it is likely to fail.	Yellow (minor)
	Fan spinning below its speed	• Check if the fan is spinning below the configured speed. • Replace the fan module as it is likely to fail.	Yellow (minor)
	Impeding fan failure	Replace the fan module.	Yellow (minor)
Power supply	A power supply has failed.	Replace the power supply.	Steady red (major)
	A power supply unit is not present.	Install a power supply unit in the empty slot. The firewall requires two power supply units to be installed.	
	Power cord is not connected.	Verify and ensure that the power cord is connected properly.	
	Power supply fan failure.	As it is a non-recoverable fault, replace the power supply.	Yellow (minor)

Table 29: Alarms for Firewall Chassis Components *(Continued)*

Component	Alarm Conditions	Action	Alarm Severity
	Input failure to the power supply	• Check the voltage of the power source if it is in the operating range. • Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Red (major)
	Power supply drawing more current than it should.	Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Yellow (minor)
	Unrecognized power supply	Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Red (major)
	Power supply not powered on.	Connect the power supply to the power source.	Red (major)

Table 29: Alarms for Firewall Chassis Components *(Continued)*

Component	Alarm Conditions	Action	Alarm Severity
	Power supply internal devices failure.	• Replace the power supply. • Open a support case using the Case Manager link at https://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).	Red (major)
	Mix of AC and DC power supplies installed.	Check if all the power supplies installed are of the same type.	Yellow (minor)
SSD	SSD detection failure	• Check if there is power supply to the SSD slot. • Check if the SSD initialization in BIOS is failing. • Replace the faulty SSD.	Yellow (minor)
	SSD runtime read/write fault	• Check if there is any issue with the SATA BUS. • Check if the SSD initialization is failing. • Faulty SSD. • Replace the faulty SSD.	Yellow (minor)

Table 29: Alarms for Firewall Chassis Components *(Continued)*

Component	Alarm Conditions	Action	Alarm Severity
	SSD File system corrupted	• Check if there is any issue with the SSD subsystem. • Was there any abrupt power removal to the firewall. • Check if any non graceful shutdown or reset of the firewall. • Check for RAM related issues. • Recover or re-image the SSD	Yellow (minor)
USB	USB Device not detected	• Check if there is any power supply issue to the USB slot. • Check for the port level failures. • Check for USB link to port from PCH failures. • Check if the USB is faulty, and replace the faulty USB.	Yellow (minor)

Troubleshooting the SRX4600 Firewall Cooling System

IN THIS SECTION

Problem

Description

A single fan module or fan modules are not functioning normally.

Solution

Follow these guidelines to troubleshoot the fan modules:

- Check the LEDs on the fan module and alarm LEDs on the front panel of the firewall.
- If the alarm LED on the front panel of the firewall is lit, use the following CLI command to get information about the source of an alarm condition:

  `user@host> show chassis alarms`.

  If the CLI output lists only one fan failure, and the other fans are functioning normally, the fan is most likely faulty and you must replace the fan tray.
- Place your hand near the near the fan modules to determine whether the fans are pushing air out of the chassis.
- If the fan tray is removed, a minor alarm or a major alarm is raised.
- The following conditions automatically cause the fans to run at full speed and also trigger the indicated alarm:
  - A fan fails (major alarm).
  - The firewall temperature exceeds the “temperature warm” threshold (minor alarm).
  - The temperature of the firewall exceeds the maximum (“temperature hot”) threshold (major alarm and automatic shutdown of the power supplies).

Troubleshooting the SRX4600 Firewall Power System

IN THIS SECTION

Problem

Description

The power system is not functioning normally.

Solution

- Check the LEDs on each power supply faceplate. If an AC or a DC power supply is correctly installed and functioning normally, then the LEDs glow steadily.

  For more information about power supply LEDs, see "SRX4600 Power System" on page 18.

- Use the CLI **show chassis environment pem** command to check the status of installed power supplies. The output shown below is an example.

```
user@host> show chassis environment pem
PEM 0 status:
  State                     Online
  Airflow                   Front to Back
  Temperature               OK   45 degrees C / 113 degrees F
  Temperature               OK   39 degrees C / 102 degrees F
  Temperature               OK   28 degrees C / 82 degrees F
  Firmware version          04.10
  Fan 0                     9232 RPM
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12.00     16            192      6
PEM 1 status:
  State                     Online
  Airflow                   Front to Back
```

```
Temperature                 OK   42 degrees C / 107 degrees F
Temperature                 OK   35 degrees C / 95 degrees F
Temperature                 OK   26 degrees C / 78 degrees F
Firmware version            04.10
Fan 0                       8896 RPM
DC Output           Voltage(V) Current(A)  Power(W)  Load(%)
                        12.00     18            216      7
```

If a power supply is not functioning normally, perform the following tasks to diagnose and correct the problem:

- If a red-alarm condition occurs, use the **show chassis alarms** command to determine the source of the problem.

  NOTE: If the system temperature exceeds the red-alarm threshold, Junos OS shuts down all power supplies so that no status is displayed.

  Junos OS also can shut down one of the power supplies for other reasons. In this case, the remaining power supplies provide power to the firewall, and you can still view the system status through the CLI or J-Web interface.

  NOTE: The firewall shuts down automatically if the device temperature exceeds the red-alarm threshold.

- Check that the AC input switch (—) or DC circuit breaker (|) is in the on position and that the power supply is receiving power.
- Verify that the source circuit breaker has the proper current rating. Each power supply must be connected to a separate source circuit breaker.
- Verify that the AC power cord or DC power cables from the power source to the firewall are not damaged. If the insulation is cracked or broken, immediately replace the cord or cable.
- Connect the power supply to a different power source with a new power cord or power cables. If the power supply status LEDs indicate that the power supply is not functioning normally, the power supply is the source of the problem. Replace the power supply with a spare, as described in "Replacing an SRX4600 Firewall AC Power Supply" on page 77 or "Replacing an SRX4600 Firewall DC Power Supply" on page 80.
- Verify that power supply is functioning properly by checking the status of power supply LED. For more information, see "SRX4600 Power System" on page 18.

- If you cannot determine the cause of the problem or need additional assistance while troubleshooting a firewall, open a support case using the Case Manager link at: https://www.juniper.net/support/ , or call 1-888-314-JTAC (within the United States) or 1-408-745-9500.

Using the RESET Button on the SRX4600 Firewall

To cold reboot the SRX4600 Firewall, press and hold the **RESET** button for less than 5 seconds.

> ⚠ **CAUTION**: Do not press and hold the RESET button for more that 5 seconds.

RELATED DOCUMENTATION

- Understanding the SRX4600 Firewall Chassis | **4**
- Understanding the SRX4600 Firewall Cooling System and Air Flow | **15**
- Routine Maintenance Procedures for the SRX4600 Firewall | **70**

CHAPTER 6

Contacting Customer Support and Returning the Chassis or Components

IN THIS CHAPTER

Returning the SRX4600 Chassis or Components

IN THIS SECTION

Contacting Customer Support

Once you have located the serial numbers of the device or component, you can return the device or component for repair or replacement. For this, you need to contact Juniper Networks Technical Assistance Center (JTAC).

You can contact JTAC 24 hours a day, 7 days a week, using any of the following methods:

- On the Web: Using the Service Request Manager link at https://support.juniper.net/support/
- By telephone:
  - From the US and Canada: 1-888-314-JTAC
  - From all other locations: 1-408-745-9500

> **NOTE**: If contacting JTAC by telephone, enter your 12-digit service request number followed by the pound (#) key if this is an existing case, or press the star (*) key to be routed to the next available support engineer.

When requesting support from JTAC by telephone, be prepared to provide the following information:

- Your existing service request number, if you have one
- Details of the failure or problem
- Type of activity being performed on the firewall when the problem occurred
- Configuration data displayed by one or more `show` commands

- Your name, organization name, telephone number, fax number, and shipping address

The support representative validates your request and issues a Return Materials Authorization (RMA) number for return of the device or component.

Return Procedure for the SRX4600 Firewall or Component to Juniper Networks

If a problem cannot be resolved by the JTAC technician, a Return Materials Authorization (RMA) is issued. This number is used to track the returned material at the factory and to return repaired or new components to the customer as needed.

NOTE: Do not return any component to Juniper Networks, Inc. unless you have first obtained an RMA number. Juniper Networks, Inc. reserves the right to refuse shipments that do not have an RMA. Refused shipments will be returned to the customer via collect freight.

For more information about return and repair policies, see the customer support Web page at https://www.juniper.net/support/guidelines.html .

To return a firewall or component to Juniper Networks for repair or replacement:

1. Determine the part number and serial number of the firewall or component.
2. Obtain a Return Materials Authorization (RMA) number from JTAC.

   NOTE: Do not return the firewall or any component to Juniper Networks unless you have first obtained an RMA number. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer via collect freight.

3. Pack the firewall or component for shipping.

For more information about return and repair policies, see the customer support webpage at https://www.juniper.net/support/guidelines.html .

For product problems or technical support issues, open a support case using the Case Manager link at https://support.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).

Locating the Serial Number on the SRX4600 Firewall or Component

IN THIS SECTION

If you are returning a firewall or hardware component to Juniper Networks for repair or replacement, you must locate the serial number of the firewall or component. You must provide the serial number to the Juniper Networks Technical Assistance Center (JTAC) when you contact them to obtain Return Materials Authorization (RMA).

If the firewall is operational and you can access the CLI, you can list serial numbers for the firewall and for some components with a CLI command. If you do not have access to the CLI or if the serial number for the component does not appear in the command output, you can locate the serial number ID label on the physical device or component.

Listing the SRX4600 Firewall Component Details with the CLI

Before contacting Juniper Networks to request a Return Materials Authorization (RMA), you must find the serial number on the SRX4600 Firewall or component. To list all the SRX4600 Firewall components and their serial numbers, enter the following CLI command:

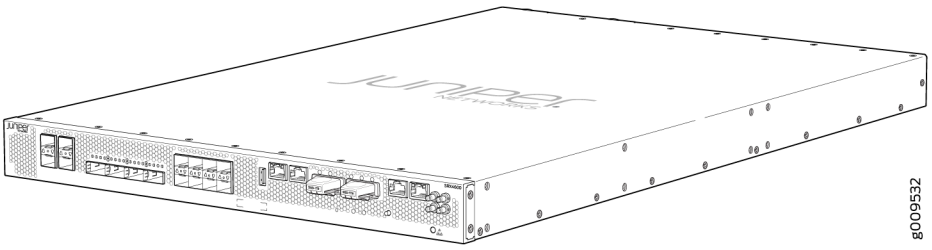
```
user@host> show chassis hardware
Hardware inventory:
Item             Version Part number Serial number Description
Chassis                              JN12642A8JCA  SRX4600
Routing Engine 0         BUILTIN     BUILTIN       Routing Engine
Pseudo CB 0
  Mezz           REV 11  711-066896  CAHR4936      Control Mezz Board
FPC 0            REV 08  711-065484  CAHM6659      SRX4600 SPM
  CPU
  PIC 0                  BUILTIN     BUILTIN       4x 10GE SFP+ HA
FPC 1            REV 09  711-065676  CAHP0571      SRX4600 MPC
  CPU
```

```
  PIC 0                 BUILTIN     BUILTIN       MRATE-4xQSFPP-XGE-XLGE-CGE
  PIC 1                 BUILTIN     BUILTIN       8x 10GE SFP+
    Xcvr 0       REV 01  740-031980  AD170930SRR   SFP+-10G-SR
    Xcvr 1       REV 01  740-031980  AD170930SRN   SFP+-10G-SR
    Xcvr 2       REV 01  740-031980  AD1709317TX   SFP+-10G-SR
    Xcvr 3       REV 01  740-031980  AD170930SS0   SFP+-10G-SR
    Xcvr 4       REV 01  740-031980  AD1709317SS   SFP+-10G-SR
    Xcvr 6       REV 01  740-031980  MVC1UML       SFP+-10G-SR
    Xcvr 7       REV 01  740-031980  B11B03249     SFP+-10G-SR
Power Supply 0   REV 01  740-066937  1HS16480004   JNP-PWR1600-AC
Power Supply 1   REV 01  740-066937  1HS16500054   JNP-PWR1600-AC
Fan Tray 0                                         Fan Tray, Front to Back Airflow - AFO
Fan Tray 1                                         Fan Tray, Front to Back Airflow - AFO
Fan Tray 2                                         Fan Tray, Front to Back Airflow - AFO
Fan Tray 3                                         Fan Tray, Front to Back Airflow - AFO
Fan Tray 4                                         Fan Tray, Front to Back Airflow - AFO
```

Locating the SRX4600 Firewall Chassis Serial Number ID Label

The serial number ID label is located on the top of the chassis. See Figure 45 on page 122 for the location on an SRX4600 Firewall.

Figure 45: SRX4600 Firewall Serial Number Location

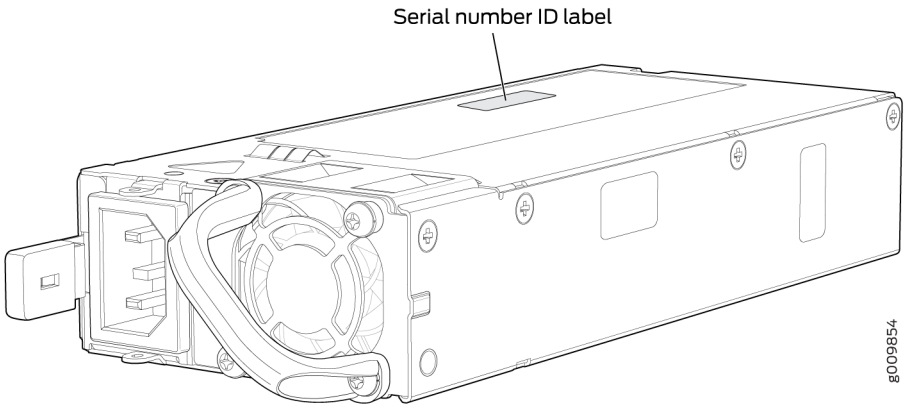


Locating the Serial Number ID Labels on SRX4600 Firewall Power Supplies

The power supplies installed in an SRX4600 Firewall are field-replaceable units (FRUs). For each FRU, you must remove the FRU from the firewall chassis to see the FRU serial number ID label.

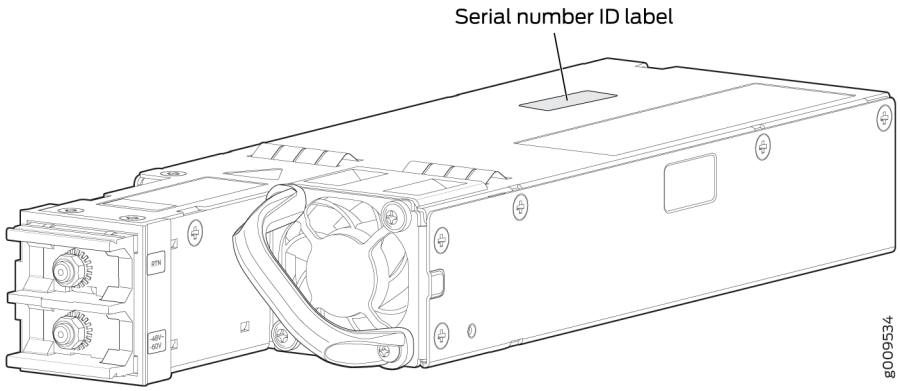
- AC power supply—The serial number ID label is on the top of the AC power supply. See Figure 46 on page 123.

Figure 46: SRX4600 Firewall AC Power Supply Serial Number Location



- DC power supply—The serial number ID label is on the top of the DC power supply. See Figure 47 on page 123.

Figure 47: SRX4600 Firewall DC Power Supply Serial Number Location

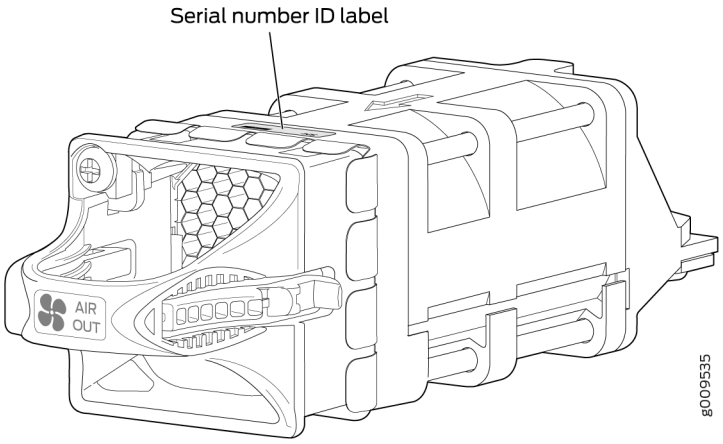


Locating the Serial Number ID Labels on SRX4600 Firewall Fan Modules

The five fan modules installed in an SRX4600 Firewall are field-replaceable units (FRUs). For each FRU, you must remove the FRU from the firewall chassis to see the FRU serial number ID label.

The serial number ID label is on the top of the fan module. See Figure 48 on page 124.

Figure 48: SRX4600 Firewall Fan Module Serial Number Location

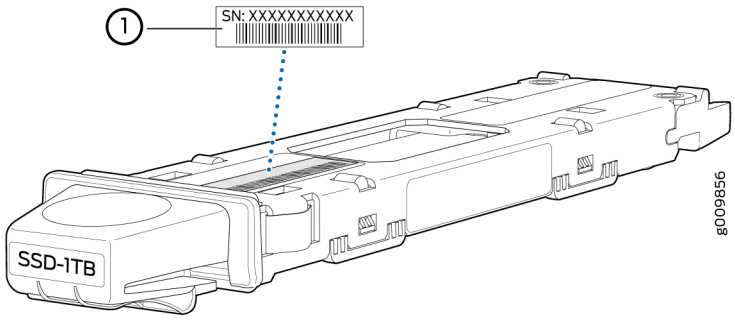


Locating the Serial Number ID Labels on SRX4600 Firewall SSDs

The two SSDs installed in the SRX4600 Firewall are field-replaceable unit (FRUs). For each FRU, you must remove the FRU from the firewall chassis to see the FRU serial number ID label.

The serial number ID label is on the top of the SSD. See Figure 49 on page 124.

Figure 49: SRX4600 Firewall SSD Serial Number Location



1– Serial number	

Packing an SRX4600 Firewall or Component for Shipping

IN THIS SECTION

Before you pack an SRX4600 Firewall or component:

- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage.
- Retrieve the original shipping carton and packing materials. Contact your JTAC representative if you do not have these materials, to learn about approved packing materials. See "Contacting Customer Support" on page 119.

Ensure that you have the following parts and tools available:

- ESD grounding strap
- Antistatic bag, one for each component
- Phillips (+) screwdriver, number 1

Packing the SRX4600 Firewall for Shipment

To pack the firewall for shipment:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to the ESD point on the chassis or to an outside ESD point if the device is disconnected from earth ground. .
2. On the console or other management device connected to the firewall, enter CLI operational mode and issue the following command to shut down the firewall software:

   ```
   user@host> request system power-off
   ```

   Wait until a message appears on the console confirming that the operating system has halted.
3. Shut down power to the firewall.
4. Disconnect power from the firewall.
5. Remove the cables that connect to all external devices.
6. If the firewall is installed in a rack, have one person support the weight of the firewall while another person unscrews and removes the mounting screws.

7. Place the firewall in the shipping carton.
8. Cover the firewall with an ESD bag, and place the packing foam on top of and around the device.
9. Replace the accessory box on top of the packing foam.
10. Securely tape the box closed.
11. Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

Packing the SRX4600 Firewall Components for Shipment

Follow these guidelines for packing and shipping individual components of the firewall:

- When you return a component, make sure that it is adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Use the original shipping materials if they are available.
- Place the individual component in an electrostatic bag.
- Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

CAUTION: Do not stack any of the firewall components during packing.

CHAPTER 7

Safety and Compliance Information

IN THIS CHAPTER

General Safety Guidelines and Warnings

The following guidelines help ensure your safety and protect the device from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in the hardware documentation for this device. Make sure that only authorized service personnel perform other system services.
- Keep the area around the device clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Do not wear loose clothing or jewelry, such as rings, bracelets, or chains, which could become caught in the device.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person to handle.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the device only when it is properly grounded.
- Follow the instructions in this guide to properly ground the device to earth.
- Replace fuses only with fuses of the same type and rating.
- Do not open or remove chassis covers or sheet-metal parts unless instructions are provided in the hardware documentation for this device. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the chassis or onto any device component. Such an action could cause electrical shock or damage the device.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.

- Some parts of the chassis, including AC and DC power supply surfaces, power supply unit handles, SFB card handles, and fan tray handles might become hot. The following label provides the warning for hot surfaces on the chassis:

- Always ensure that all modules, power supplies, and cover panels are fully inserted and that the installation screws are fully tightened.

Definitions of Safety Warning Levels

The documentation uses the following levels of safety warnings (there are two *Warning* formats):

NOTE: You might find this information helpful in a particular situation, or you might overlook this important information if it was not highlighted in a Note.

CAUTION: You need to observe the specified guidelines to prevent minor injury or discomfort to you or severe damage to the device.

Attention Veillez à respecter les consignes indiquées pour éviter toute incommodité ou blessure légère, voire des dégâts graves pour l'appareil.

LASER WARNING: This symbol alerts you to the risk of personal injury from a laser.

Avertissement Ce symbole signale un risque de blessure provoquée par rayon laser.

WARNING: This symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry, and familiarize yourself with standard practices for preventing accidents.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient

u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

Avertissement Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

¡Atención! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

Restricted Access Area Warning

WARNING: The Firewall is intended for installation in restricted access areas. A restricted access area is an area to which access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and which is controlled by the authority responsible for the location.

Waarschuwing Dit toestel is bedoeld voor installatie op plaatsen met beperkte toegang. Een plaats met beperkte toegang is een plaats waar toegang slechts door servicepersoneel verkregen kan worden door middel van een speciaal instrument, een slot en sleutel, of een ander veiligheidsmiddel, en welke beheerd wordt door de overheidsinstantie die verantwoordelijk is voor de locatie.

Varoitus Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Paikka, johon pääsy on rajoitettua, tarkoittaa paikkaa, johon vain huoltohenkilöstö pääsee jonkin erikoistyökalun, lukkoon sopivan avaimen tai jonkin muun turvalaitteen avulla ja joka on paikasta vastuussa olevien toimivaltaisten henkilöiden valvoma.

Attention Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. L'accès aux zones de sécurité est sous le contrôle de l'autorité responsable de l'emplacement.

Warnung Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Ein Bereich mit beschränktem Zutritt ist ein Bereich, zu dem nur Wartungspersonal mit einem Spezialwerkzeugs, Schloß und Schlüssel oder anderer Sicherheitsvorkehrungen Zugang hat, und der von dem für die Anlage zuständigen Gremium kontrolliert wird.

Avvertenza Questa unità deve essere installata in un'area ad accesso limitato. Un'area ad accesso limitato è un'area accessibile solo a personale di assistenza tramite un'attrezzo speciale, lucchetto, o altri dispositivi di sicurezza, ed è controllata dall'autorità responsabile della zona.

Advarsel Denne enheten er laget for installasjon i områder med begrenset adgang. Et område med begrenset adgang gir kun adgang til servicepersonale som bruker et spesielt verktøy, lås og nøkkel, eller en annen sikkerhetsanordning, og det kontrolleres av den autoriteten som er ansvarlig for området.

Aviso Esta unidade foi concebida para instalação em áreas de acesso restrito. Uma área de acesso restrito é uma área à qual apenas tem acesso o pessoal de serviço autorizado,

que possua uma ferramenta, chave e fechadura especial, ou qualquer outra forma de segurança. Esta área é controlada pela autoridade responsável pelo local.

¡Atención! Esta unidad ha sido diseñada para instalarse en áreas de acceso restringido. Área de acceso restringido significa un área a la que solamente tiene acceso el personal de servicio mediante la utilización de una herramienta especial, cerradura con llave, o algún otro medio de seguridad, y que está bajo el control de la autoridad responsable del local.

Varning! Denna enhet är avsedd för installation i områden med begränsat tillträde. Ett område med begränsat tillträde får endast tillträdas av servicepersonal med ett speciellt verktyg, lås och nyckel, eller annan säkerhetsanordning, och kontrolleras av den auktoritet som ansvarar för området.

RELATED DOCUMENTATION

- *Definitions of Safety Warning Levels*
- *General Safety Guidelines and Warnings*
- *Qualified Personnel Warning*
- *Prevention of Electrostatic Discharge Damage*

Fire Safety Requirements

IN THIS SECTION

In the event of a fire emergency, the safety of people is the primary concern. You should establish procedures for protecting people in the event of a fire emergency, provide safety training, and properly provision fire-control equipment and fire extinguishers.

In addition, you should establish procedures to protect your equipment in the event of a fire emergency. Juniper Networks products should be installed in an environment suitable for electronic equipment. We

recommend that fire suppression equipment be available in the event of a fire in the vicinity of the equipment and that all local fire, safety, and electrical codes and ordinances be observed when you install and operate your equipment.

Fire Suppression

In the event of an electrical hazard or an electrical fire, you should first turn power off to the equipment at the source. Then use a Type C fire extinguisher, which uses noncorrosive fire retardants, to extinguish the fire.

Fire Suppression Equipment

Type C fire extinguishers, which use noncorrosive fire retardants such as carbon dioxide and Halotron™, are most effective for suppressing electrical fires. Type C fire extinguishers displace oxygen from the point of combustion to eliminate the fire. For extinguishing fire on or around equipment that draws air from the environment for cooling, you should use this type of inert oxygen displacement extinguisher instead of an extinguisher that leaves residues on equipment.

Do not use multipurpose Type ABC chemical fire extinguishers (dry chemical fire extinguishers). The primary ingredient in these fire extinguishers is monoammonium phosphate, which is very sticky and difficult to clean. In addition, in the presence of minute amounts of moisture, monoammonium phosphate can become highly corrosive and corrodes most metals.

Any equipment in a room in which a chemical fire extinguisher has been discharged is subject to premature failure and unreliable operation. The equipment is considered to be irreparably damaged.

NOTE: To keep warranties effective, do not use a dry chemical fire extinguisher to control a fire at or near a Juniper Networks device. If a dry chemical fire extinguisher is used, the unit is no longer eligible for coverage under a service agreement.

We recommend that you dispose of any irreparably damaged equipment in an environmentally responsible manner.

Qualified Personnel Warning

WARNING: Only trained and qualified personnel should install or replace the device.
Waarschuwing Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

Varoitus Ainoastaan koulutettu ja pätevä henkilökunta saa asentaa tai vaihtaa tämän laitteen.

Avertissement Tout installation ou remplacement de l'appareil doit être réalisé par du personnel qualifié et compétent.

Warnung Gerät nur von geschultem, qualifiziertem Personal installieren oder auswechseln lassen.

Avvertenza Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.

Advarsel Kun kvalifisert personell med riktig opplæring bør montere eller bytte ut dette utstyret.

Aviso Este equipamento deverá ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.

¡Atención! Estos equipos deben ser instalados y reemplazados exclusivamente por personal técnico adecuadamente preparado y capacitado.

Varning! Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.

Warning Statement for Norway and Sweden

WARNING: The equipment must be connected to an earthed mains socket-outlet.
Advarsel Apparatet skal kobles til en jordet stikkontakt.

Varning! Apparaten skall anslutas till jordat nätuttag.

Installation Instructions Warning

WARNING: Read the installation instructions before you connect the device to a power source.
Waarschuwing Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

Varoitus Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Avertissement Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

Avvertenza Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

¡Atención! Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Varning! Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Chassis and Component Lifting Guidelines

- Before moving the device to a site, ensure that the site meets the power, environmental, and clearance requirements.
- Before lifting or moving the device, disconnect all external cables and wires.
- As when lifting any heavy object, ensure that your legs bear most of the weight rather than your back. Keep your knees bent and your back relatively straight. Do not twist your body as you lift. Balance the load evenly and be sure that your footing is firm.
- Use the following lifting guidelines to lift devices and components:

- Up to 39.7 lb (18 kg): One person.
- From 39.7 lb (18 kg) to 70.5 lb (32 kg): Two or more people.
- From 70.5 lb (32 kg) to 121.2 lb (55 kg): Three or more people.
- Above 121.2 lb (55 kg): Use material handling systems (such as levers, slings, lifts, and so on). When this is not practical, engage specially trained persons or systems (such as riggers or movers).

Ramp Warning

WARNING: When installing the device, do not use a ramp inclined at more than 10 degrees.
Waarschuwing Gebruik een oprijplaat niet onder een hoek van meer dan 10 graden.

Varoitus Älä käytä sellaista kaltevaa pintaa, jonka kaltevuus ylittää 10 astetta.

Avertissement Ne pas utiliser une rampe dont l'inclinaison est supérieure à 10 degrés.

Warnung Keine Rampen mit einer Neigung von mehr als 10 Grad verwenden.

Avvertenza Non usare una rampa con pendenza superiore a 10 gradi.

Advarsel Bruk aldri en rampe som heller mer enn 10 grader.

Aviso Não utilize uma rampa com uma inclinação superior a 10 graus.

¡Atención! No usar una rampa inclinada más de 10 grados.

Varning! Använd inte ramp med en lutning på mer än 10 grader.

Rack-Mounting and Cabinet-Mounting Warnings

Ensure that the rack or cabinet in which the device is installed is evenly and securely supported. Uneven mechanical loading could lead to a hazardous condition.

WARNING: To prevent bodily injury when mounting or servicing the device in a rack, take the following precautions to ensure that the system remains stable. The following directives help maintain your safety:

- Install the device in a rack that is secured to the building structure.
- Mount the device at the bottom of the rack if it is the only unit in the rack.
- When mounting the device on a partially filled rack, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing equipment, install the stabilizers before mounting or servicing the device in the rack.

Waarschuwing Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- De Juniper Networks switch moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.
- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

Varoitus Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- Juniper Networks switch on asennettava telineeseen, joka on kiinnitetty rakennukseen.
- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.

- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

Avertissement Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

- Le rack sur lequel est monté le Juniper Networks switch doit être fixé à la structure du bâtiment.
- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

Warnung Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:

- Der Juniper Networks switch muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.
- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

Avvertenza Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:

- Il Juniper Networks switch deve essere installato in un telaio, il quale deve essere fissato alla struttura dell'edificio.
- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
- Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
- Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

Advarsel Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:

- Juniper Networks switch må installeres i et stativ som er forankret til bygningsstrukturen.
- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.
- Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
- Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

Aviso Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:

- O Juniper Networks switch deverá ser instalado numa prateleira fixa à estrutura do edificio.
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.

- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

¡Atención! Para evitar lesiones durante el montaje de este equipo sobre un bastidor, oeriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:

- El Juniper Networks switch debe instalarse en un bastidor fijado a la estructura del edificio.
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

Varning! För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- Juniper Networks switch måste installeras i en ställning som är förankrad i byggnadens struktur.
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Grounded Equipment Warning

WARNING: This device must be properly grounded at all times. Follow the instructions in this guide to properly ground the device to earth.

Waarschuwing Dit apparaat moet altijd goed geaard zijn. Volg de instructies in deze gids om het apparaat goed te aarden.

Varoitus Laitteen on oltava pysyvästi maadoitettu. Maadoita laite asianmukaisesti noudattamalla tämän oppaan ohjeita.

Avertissement L'appareil doit être correctement mis à la terre à tout moment. Suivez les instructions de ce guide pour correctement mettre l'appareil à la terre.

Warnung Das Gerät muss immer ordnungsgemäß geerdet sein. Befolgen Sie die Anweisungen in dieser Anleitung, um das Gerät ordnungsgemäß zu erden.

Avvertenza Questo dispositivo deve sempre disporre di una connessione a massa. Seguire le istruzioni indicate in questa guida per connettere correttamente il dispositivo a massa.

Advarsel Denne enheten på jordes skikkelig hele tiden. Følg instruksjonene i denne veiledningen for å jorde enheten.

Aviso Este equipamento deverá estar ligado à terra. Siga las instrucciones en esta guía para conectar correctamente este dispositivo a tierra.

¡Atención! Este dispositivo debe estar correctamente conectado a tierra en todo momento. Siga las instrucciones en esta guía para conectar correctamente este dispositivo a tierra.

Varning! Den här enheten måste vara ordentligt jordad. Följ instruktionerna i den här guiden för att jorda enheten ordentligt.

Laser and LED Safety Guidelines and Warnings

IN THIS SECTION

Juniper Networks devices are equipped with laser transmitters, which are considered a Class 1 Laser Product by the U.S. Food and Drug Administration and are evaluated as a Class 1 Laser Product per IEC/EN 60825-1 requirements.

Observe the following guidelines and warnings:

General Laser Safety Guidelines

When working around ports that support optical transceivers, observe the following safety guidelines to prevent eye injury:

- Do not look into unterminated ports or at fibers that connect to unknown sources.
- Do not examine unterminated optical ports with optical instruments.
- Avoid direct exposure to the beam.

LASER WARNING: Unterminated optical connectors can emit invisible laser radiation. The lens in the human eye focuses all the laser power on the retina, so focusing the eye directly on a laser source—even a low-power laser—could permanently damage the eye.

Avertissement Les connecteurs à fibre optique sans terminaison peuvent émettre un rayonnement laser invisible. Le cristallin de l'œil humain faisant converger toute la puissance du laser sur la rétine, toute focalisation directe de l'œil sur une source laser, — même de faible puissance—, peut entraîner des lésions oculaires irréversibles.

Class 1 Laser Product Warning

LASER WARNING: Class 1 laser product.

Waarschuwing Klasse-1 laser produkt.

Varoitus Luokan 1 lasertuote.

Avertissement Produit laser de classe I.

Warnung Laserprodukt der Klasse 1.

Avvertenza Prodotto laser di Classe 1.

Advarsel Laserprodukt av klasse 1.

Aviso Produto laser de classe 1.

¡Atención! Producto láser Clase I.

Varning! Laserprodukt av klass 1.

Class 1 LED Product Warning

LASER WARNING: Class 1 LED product.
Waarschuwing Klasse 1 LED-product.

Varoitus Luokan 1 valodiodituote.

Avertissement Alarme de produit LED Class I.

Warnung Class 1 LED-Produktwarnung.

Avvertenza Avvertenza prodotto LED di Classe 1.

Advarsel LED-produkt i klasse 1.

Aviso Produto de classe 1 com LED.

¡Atención! Aviso sobre producto LED de Clase 1.

Varning! Lysdiodprodukt av klass 1.

Laser Beam Warning

LASER WARNING: Do not stare into the laser beam or view it directly with optical instruments.
Waarschuwing Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

Varoitus Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

Avertissement Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

Warnung Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

Avvertenza Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

Advarsel Stirr eller se ikke direkte p strlen med optiske instrumenter.

Aviso Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

¡Atención! No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

Varning! Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.

Radiation from Open Port Apertures Warning

LASER WARNING: Because invisible radiation might be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.
Waarschuwing Aangezien onzichtbare straling vanuit de opening van de poort kan komen als er geen fiberkabel aangesloten is, dient blootstelling aan straling en het kijken in open openingen vermeden te worden.

Varoitus Koska portin aukosta voi emittoitua näkymätöntä säteilyä, kun kuitukaapelia ei ole kytkettynä, vältä säteilylle altistumista äläkä katso avoimiin aukkoihin.

Avertissement Des radiations invisibles à l'il nu pouvant traverser l'ouverture du port lorsqu'aucun câble en fibre optique n'y est connecté, il est recommandé de ne pas regarder fixement l'intérieur de ces ouvertures.

Warnung Aus der Port-Öffnung können unsichtbare Strahlen emittieren, wenn kein Glasfaserkabel angeschlossen ist. Vermeiden Sie es, sich den Strahlungen auszusetzen, und starren Sie nicht in die Öffnungen!

Avvertenza Quando i cavi in fibra non sono inseriti, radiazioni invisibili possono essere emesse attraverso l'apertura della porta. Evitate di esporvi alle radiazioni e non guardate direttamente nelle aperture.

Advarsel Unngå utsettelse for stråling, og stirr ikke inn i åpninger som er åpne, fordi usynlig stråling kan emiteres fra portens åpning når det ikke er tilkoblet en fiberkabel.

Aviso Dada a possibilidade de emissão de radiação invisível através do orifício da via de acesso, quando esta não tiver nenhum cabo de fibra conectado, deverá evitar an EXposição à radiação e não deverá olhar fixamente para orifícios que se encontrarem a descoberto.

¡Atención! Debido a que la apertura del puerto puede emitir radiación invisible cuando no existe un cable de fibra conectado, evite mirar directamente a las aperturas para no exponerse a la radiación.

Varning! Osynlig strålning kan avges från en portöppning utan ansluten fiberkabel och du bör därför undvika att bli utsatt för strålning genom att inte stirra in i oskyddade öppningar.

Maintenance and Operational Safety Guidelines and Warnings

IN THIS SECTION

While performing the maintenance activities for devices, observe the following guidelines and warnings:

Battery Handling Warning

WARNING: Replacing a battery incorrectly might result in an explosion. Replace a battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Waarschuwing Er is ontploffingsgevaar als de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type dat door de fabrikant aanbevolen is. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften weggeworpen te worden.

Varoitus Räjähdyksen vaara, jos akku on vaihdettu väärään akkuun. Käytä vaihtamiseen ainoastaan saman- tai vastaavantyyppistä akkua, joka on valmistajan suosittelema. Hävitä käytetyt akut valmistajan ohjeiden mukaan.

Avertissement Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

Warnung Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Advarsel Det kan være fare for eksplosjon hvis batteriet skiftes på feil måte. Skift kun med samme eller tilsvarende type som er anbefalt av produsenten. Kasser brukte batterier i henhold til produsentens instruksjoner.

Avvertenza Pericolo di esplosione se la batteria non è installata correttamente. Sostituire solo con una di tipo uguale o equivalente, consigliata dal produttore. Eliminare le batterie usate secondo le istruzioni del produttore.

Aviso Existe perigo de explosão se a bateria for substituída incorrectamente. Substitua a bateria por uma bateria igual ou de um tipo equivalente recomendado pelo fabricante. Destrua as baterias usadas conforme as instruções do fabricante.

¡Atención! Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la baterían EXclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

Varning! Explosionsfara vid felaktigt batteribyte. Ersätt endast batteriet med samma batterityp som rekommenderas av tillverkaren eller motsvarande. Följ tillverkarens anvisningar vid kassering av använda batterier.

Jewelry Removal Warning

WARNING: Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or can be welded to the terminals.

Waarschuwing Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

Varoitus Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitäntänapoihin.

Avertissement Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.

Warnung Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.

Avvertenza Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.

Advarsel Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.

Aviso Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.

¡Atención! Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.

Varning! Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.

Lightning Activity Warning

WARNING: Do not work on the system or connect or disconnect cables during periods of lightning activity.

Waarschuwing Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.

Varoitus Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.

Avertissement Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.

Warnung Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.

Avvertenza Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.

Advarsel Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.

Aviso Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).

¡Atención! No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.

Varning! Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.

Operating Temperature Warning

WARNING: To prevent the device from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature. To prevent airflow restriction, allow at least 6 in. (15.2 cm) of clearance around the ventilation openings.

Waarschuwing Om te voorkomen dat welke switch van de Juniper Networks router dan ook oververhit raakt, dient u deze niet te bedienen op een plaats waar de maximale aanbevolen omgevingstemperatuur van 40° C wordt overschreden. Om te voorkomen dat de luchtstroom wordt beperkt, dient er minstens 15,2 cm speling rond de ventilatie-openingen te zijn.

Varoitus Ettei Juniper Networks switch-sarjan reititin ylikuumentuisi, sitä ei saa käyttää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 40° C. Ettei ilmanvaihto estyisi, tuuletusaukkojen ympärille on jätettävä ainakin 15,2 cm tilaa.

Avertissement Pour éviter toute surchauffe des routeurs de la gamme Juniper Networks switch, ne l'utilisez pas dans une zone où la température ambiante est supérieure à 40° C. Pour permettre un flot d'air constant, dégagez un espace d'au moins 15,2 cm autour des ouvertures de ventilations.

Warnung Um einen Router der switch vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene

Maximum von 40° C überschreitet. Um Lüftungsverschluß zu verhindern, achten Sie darauf, daß mindestens 15,2 cm lichter Raum um die Lüftungsöffnungen herum frei bleibt.

Avvertenza Per evitare il surriscaldamento dei switch, non adoperateli in un locale che ecceda la temperatura ambientale massima di 40° C. Per evitare che la circolazione dell'aria sia impedita, lasciate uno spazio di almeno 15.2 cm di fronte alle aperture delle ventole.

Advarsel Unngå overoppheting av eventuelle rutere i Juniper Networks switch Disse skal ikke brukes på steder der den anbefalte maksimale omgivelsestemperaturen overstiger 40° C (104° F). Sørg for at klaringen rundt lufteåpningene er minst 15,2 cm (6 tommer) for å forhindre nedsatt luftsirkulasjon.

Aviso Para evitar o sobreaquecimento do encaminhador Juniper Networks switch, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 40° C. Para evitar a restrição à circulação de ar, deixe pelo menos um espaço de 15,2 cm à volta das aberturas de ventilação.

¡Atención! Para impedir que un encaminador de la serie Juniper Networks switch se recaliente, no lo haga funcionar en un área en la que se supere la temperatura ambiente máxima recomendada de 40° C. Para impedir la restricción de la entrada de aire, deje un espacio mínimo de 15,2 cm alrededor de las aperturas para ventilación.

Varning! Förhindra att en Juniper Networks switch överhettas genom att inte använda den i ett område där den maximalt rekommenderade omgivningstemperaturen på 40° C överskrids. Förhindra att luftcirkulationen inskränks genom att se till att det finns fritt utrymme på minst 15,2 cm omkring ventilationsöppningarna.

Product Disposal Warning

WARNING: Disposal of this device must be handled according to all national laws and regulations.

Waarschuwing Dit produkt dient volgens alle landelijke wetten en voorschriften te worden afgedankt.

Varoitus Tämän tuotteen lopullisesta hävittämisestä tulee huolehtia kaikkia valtakunnallisia lakeja ja säännöksiä noudattaen.

Avertissement La mise au rebut définitive de ce produit doit être effectuée conformément à toutes les lois et réglementations en vigueur.

Warnung Dieses Produkt muß den geltenden Gesetzen und Vorschriften entsprechend entsorgt werden.

Avvertenza L'eliminazione finale di questo prodotto deve essere eseguita osservando le normative italiane vigenti in materia

Advarsel Endelig disponering av dette produktet må skje i henhold til nasjonale lover og forskrifter.

Aviso A descartagem final deste produto deverá ser efectuada de acordo com os regulamentos e a legislação nacional.

¡Atención! El desecho final de este producto debe realizarse según todas las leyes y regulaciones nacionales

Varning! Slutlig kassering av denna produkt bör skötas i enlighet med landets alla lagar och föreskrifter.

General Electrical Safety Guidelines and Warnings

WARNING: Certain ports on the device are designed for use as intrabuilding (within-the-building) interfaces only (Type 2 or Type 4 ports as described in *GR-1089-CORE*) and require isolation from the exposed outside plant (OSP) cabling. To comply with NEBS (Network Equipment-Building System) requirements and protect against lightning surges and commercial power disturbances, the intrabuilding ports *must not* be metallically connected to interfaces that connect to the OSP or its wiring. The intrabuilding ports on the device are suitable for connection to intrabuilding or unexposed wiring or cabling only. The addition of primary protectors is not sufficient protection for connecting these interfaces metallically to OSP wiring.

Avertissement Certains ports de l'appareil sont destinés à un usage en intérieur uniquement (ports Type 2 ou Type 4 tels que décrits dans le document *GR-1089-CORE*) et doivent être isolés du câblage de l'installation extérieure exposée. Pour respecter les exigences NEBS et assurer une protection contre la foudre et les perturbations de tension secteur, les ports pour intérieur *ne doivent pas* être raccordés physiquement aux interfaces prévues pour la connexion à l'installation extérieure ou à son câblage. Les

ports pour intérieur de l'appareil sont réservés au raccordement de câbles pour intérieur ou non exposés uniquement. L'ajout de protections ne constitue pas une précaution suffisante pour raccorder physiquement ces interfaces au câblage de l'installation extérieure.

CAUTION: Before removing or installing components of a device, connect an electrostatic discharge (ESD) grounding strap to an ESD point and wrap and fasten the other end of the strap around your bare wrist. Failure to use an ESD grounding strap could result in damage to the device.

Attention Avant de retirer ou d'installer des composants d'un appareil, raccordez un bracelet antistatique à un point de décharge électrostatique et fixez le bracelet à votre poignet nu. L'absence de port d'un bracelet antistatique pourrait provoquer des dégâts sur l'appareil.

- Install the device in compliance with the following local, national, and international electrical codes:
  - United States—National Fire Protection Association (NFPA 70), United States National Electrical Code.
  - Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7.
  - Evaluated to the TN power system.
  - Canada—Canadian Electrical Code, Part 1, CSA C22.1.
  - Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

    Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.
- Make sure that you clean grounding surface and give them a bright finish before making grounding connections.
- Do not work alone if potentially hazardous conditions exist anywhere in your workspace.
- Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.
- Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.

- Operate the device within marked electrical ratings and product usage instructions.
- To ensure that the device and peripheral equipment function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.

You can remove and replace many device components without powering off or disconnecting power to the device, as detailed elsewhere in the hardware documentation for this device. Never install equipment that appears to be damaged.

Prevention of Electrostatic Discharge Damage

Device components that are shipped in antistatic bags are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

- Always use an ESD wrist strap when you are handling components that are subject to ESD damage, and make sure that it is in direct contact with your skin.

  If a grounding strap is not available, hold the component in its antistatic bag (see Figure 50 on page 155) in one hand and touch the exposed, bare metal of the device with the other hand immediately before inserting the component into the device.

  WARNING: For safety, periodically check the resistance value of the ESD grounding strap. The measurement must be in the range 1 through 10 Mohms.

  Avertissement Par mesure de sécurité, vérifiez régulièrement la résistance du bracelet antistatique. Cette valeur doit être comprise entre 1 et 10 mégohms (Mohms).

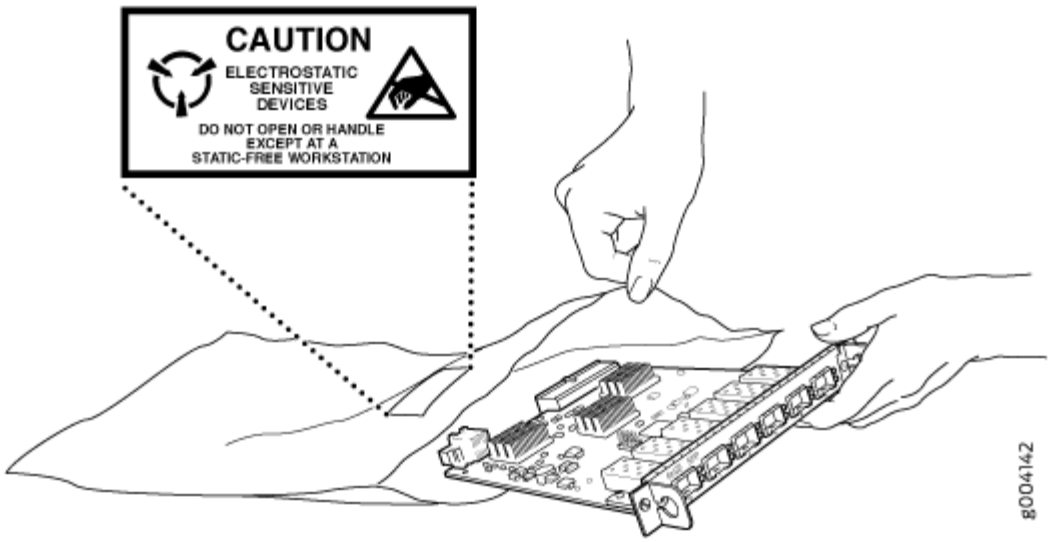
- When handling any component that is subject to ESD damage and that is removed from the device, make sure the equipment end of your ESD wrist strap is attached to the ESD point on the chassis.

  If no grounding strap is available, touch the exposed, bare metal of the device to ground yourself before handling the component.

- Avoid contact between the component that is subject to ESD damage and your clothing. ESD voltages emitted from clothing can damage components.

- When removing or installing a component that is subject to ESD damage, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an antistatic bag (see Figure 50 on page 155). If you are returning a component, place it in an antistatic bag before packing it.

Figure 50: Placing a Component into an Antistatic Bag



CAUTION: ANSI/TIA/EIA-568 cables such as Category 5e and Category 6 can get electrostatically charged. To dissipate this charge, always ground the cables to a suitable and safe earth ground before connecting them to the system.

Attention Les câbles ANSI/TIA/EIA-568, par exemple Cat 5e et Cat 6, peuvent emmagasiner des charges électrostatiques. Pour évacuer ces charges, reliez toujours les câbles à une prise de terre adaptée avant de les raccorder au système.

AC Power Electrical Safety Guidelines

The following electrical safety guidelines apply to AC-powered devices:

- Note the following warnings printed on the device:

  "**CAUTION:** THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK."

"**ATTENTION:** CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. AFIN DE PRÉVENIR LES CHOCS ÉLECTRIQUES, DÉBRANCHER TOUT CORDON D'ALIMENTATION AVANT DE FAIRE LE DÉPANNAGE."

- AC-powered devices are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding must comply with local and national electrical codes.
- You must provide an external certified circuit breaker (2-pole circuit breaker or 4-pole circuit breaker based on your device) rated minimum 20 A in the building installation.
- The power cord serves as the main disconnecting device for the AC-powered device. The socket outlet must be near the AC-powered device and be easily accessible.
- For devices that have more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the device is completely removed to prevent electric shock. To disconnect power, unplug all power cords (one for each power supply).

Power Cable Warning (Japanese)

WARNING: The attached power cable is only for this product. Do not use the cable for another product.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

AC Power Disconnection Warning

WARNING: Before working on the device or near power supplies, unplug all the power cords from an AC-powered device.

Waarschuwing Voordat u aan een frame of in de nabijheid van voedingen werkt, dient u bij wisselstroom toestellen de stekker van het netsnoer uit het stopcontact te halen.

Varoitus Kytke irti vaihtovirtalaitteiden virtajohto, ennen kuin teet mitään asennuspohjalle tai työskentelet virtalähteiden läheisyydessä.

Avertissement Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.

Warnung Bevor Sie an einem Chassis oder in der Nähe von Netzgeräten arbeiten, ziehen Sie bei Wechselstromeinheiten das Netzkabel ab bzw.

Avvertenza Prima di lavorare su un telaio o intorno ad alimentatori, scollegare il cavo di alimentazione sulle unità CA.

Advarsel Før det utføres arbeid på kabinettet eller det arbeides i nærheten av strømforsyningsenheter, skal strømledningen trekkes ut på vekselstrømsenheter.

Aviso Antes de trabalhar num chassis, ou antes de trabalhar perto de unidades de fornecimento de energia, desligue o cabo de alimentação nas unidades de corrente alternada.

¡Atención! Antes de manipular el chasis de un equipo o trabajar cerca de una fuente de alimentación, desenchufar el cable de alimentación en los equipos de corriente alterna (CA).

Varning! Innan du arbetar med ett chassi eller nära strömförsörjningsenheter skall du för växelströmsenheter dra ur nätsladden.

DC Power Electrical Safety Guidelines

IN THIS SECTION

DC Power Electrical Safety Guidelines

The following electrical safety guidelines apply to a DC-powered firewall:

- A DC-powered firewall is equipped with a DC terminal block that is rated for the power requirements of a maximally configured firewall. To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 15 A @ -48 VDC for the system. We recommend that the 48 VDC facility DC source be equipped with a circuit breaker rated at 15 A (-48 VDC) minimum, or as required by local code. Incorporate an easily accessible disconnect device into the facility wiring. In the United States and Canada, the -48 VDC facility should be equipped with a circuit breaker rated a minimum of 125% of the power provisioned for the input in accordance with the National Electrical Code in the US and the Canadian Electrical Code in Canada. Be sure to connect the ground wire or conduit to a solid office (earth) ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.
- Run two wires from the circuit breaker box to a source of 48 VDC. Use appropriate gauge wire to handle up to 15 A.
- A DC-powered firewall that is equipped with a DC terminal block is intended only for installation in a restricted access location. In the United States, a restricted access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.

  NOTE: Primary overcurrent protection is provided by the building circuit breaker. This breaker should protect against excess currents, short circuits, and earth faults in accordance with NEC ANSI/NFPA70.

- Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.
- For personal safety, connect the green and yellow wire to safety (earth) ground at both the firewall and the supply side of the DC wiring.
- The marked input voltage of -48 VDC for a DC-powered firewall is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.
- Because the firewall is a positive ground system, you must connect the positive lead to the terminal labeled **RETURN**, the negative lead to the terminal labeled **-48V**, and the earth ground to the chassis grounding points.

DC Power Disconnection Warning

WARNING: Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the **OFF** position, and tape the switch handle of the circuit breaker in the **OFF** position.

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

Varoitus Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

Attention Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.

Warnung Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

Avvertenza Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

Advarsel Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

Aviso Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que

toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

Varning! Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

DC Power Grounding Requirements and Warning

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors, but is identifiable by green and yellow stripes, is installed as part of the branch circuit that supplies the unit. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

WARNING: When installing the firewall, the ground connection must always be made first and disconnected last.

Waarschuwing Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.

Varoitus Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

Attention Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.

Warnung Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

Avvertenza In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

Advarsel Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

Aviso Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

Varning! Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

DC Power Wiring Sequence Warning

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then -48 V to -48 V. When disconnecting power, the proper wiring sequence is -48 V to -48 V, +RTN to +RTN, then ground to ground. Note that the ground wire should always be connected first and disconnected last.

Waarschuwing De juiste bedradingsvolgorde verbonden is aarde naar aarde, +RTN naar +RTN, en -48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en -48 V naar – 48 V, +RTN naar +RTN, aarde naar aarde.

Varoitus Oikea yhdistettava kytkentajarjestys on maajohto maajohtoon, +RTN varten +RTN, -48 V varten – 48 V. Oikea irrotettava kytkentajarjestys on -48 V varten – 48 V, +RTN varten +RTN, maajohto maajohtoon.

Attention Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité de câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, +RTN à +RTN, puis -48 V à -48 V. En débranchant la puissance, l'ordre approprié de câblage est -48 V à -48 V, +RTN à +RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.

Warnung Die Stromzufuhr ist nur mit geeigneten Ringösen an das DC Netzteil anzuschliessen. Die richtige Anschlusssequenz ist: Erdanschluss zu Erdanschluss, +RTN zu +RTN und dann -48V zu -48V. Die richtige Sequenz zum Abtrennen der Stromversorgung ist -48V zu -48V, +RTN zu +RTN und dann Erdanschluss zu Erdanschluss. Es ist zu beachten dass der Erdanschluss immer zuerst angeschlossen und als letztes abgetrennt wird.

Avvertenza Mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoplingssekvens er jord til jord, +RTN til +RTN, -48 V til – 48 V. Riktig frakoples tilkoplingssekvens er -48 V til – 48 V, +RTN til +RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, +RTN a +RTN, entonces -48 V a -48 V. Al desconectar potencia, la secuencia apropiada del cableado es -48 V a -48 V, +RTN a +RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.

¡Atención! Wire a fonte de alimentação de DC Usando os talões apropriados na extremidade da fiação. Ao conectar a potência, a seqüência apropriada da fiação é moída para moer, +RTN a +RTN, então -48 V a -48 V. Ao desconectar a potência, a seqüência apropriada da fiação é -48 V a -48 V, +RTN a +RTN, moeu então para moer. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último.

Varning! Korrekt kopplingssekvens ar jord till jord, +RTN till +RTN, -48 V till – 48 V. Korrekt kopplas kopplingssekvens ar -48 V till -48 V, +RTN till +RTN, jord till jord.

DC Power Wiring Terminations Warning

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor.

Waarschuwing Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

Varoitus Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

Attention Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

Warnung Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsanschlüsse, z.B. Ringoesen oder gabelförmige Kabelschuhe mit nach oben gerichteten Enden zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

Avvertenza Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcella con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

Advarsel Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

Varning! När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

RELATED DOCUMENTATION

Action to Take After an Electrical Accident

DC Power Disconnection Warning

WARNING: Before performing any of the DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the device handle of the circuit breaker in the OFF position.

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

Varoitus Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

Avertissement Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.

Warnung Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

Avvertenza Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

Advarsel Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

Aviso Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

Varning! Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

DC Power Grounding Requirements and Warning

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors but is identifiable by green and yellow stripes is installed as part of the branch circuit that supplies the device. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

WARNING: When you install the device, the ground connection must always be made first and disconnected last.

Waarschuwing Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.

Varoitus Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

Avertissement Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.

Warnung Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

Avvertenza In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

Advarsel Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

Aviso Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

Varning! Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

DC Power Wiring Sequence Warning

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, then ground to ground. Note that the ground wire must always be connected first and disconnected last.

Waarschuwing De juiste bedradingsvolgorde verbonden is aarde naar aarde, +RTN naar +RTN, en –48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en –48 naar –48 V, +RTN naar +RTN, aarde naar aarde.

Varoitus Oikea yhdistettava kytkentajarjestys on maajohto maajohtoon, +RTN varten +RTN, –48 V varten – 48 V. Oikea irrotettava kytkentajarjestys on –48 V varten – 48 V, +RTN varten +RTN, maajohto maajohtoon.

Avertissement Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité de câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, +RTN à +RTN, puis –48 V à –48 V. En débranchant la puissance, l'ordre approprié de câblage est –48 V à –48 V, +RTN à +RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché

pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.

Warnung Die Stromzufuhr ist nur mit geeigneten Ringösen an das DC Netzteil anzuschliessen. Die richtige Anschlusssequenz ist: Erdanschluss zu Erdanschluss, +RTN zu +RTN und dann -48V zu -48V. Die richtige Sequenz zum Abtrennen der Stromversorgung ist -48V zu -48V, +RTN zu +RTN und dann Erdanschluss zu Erdanschluss. Es ist zu beachten dass der Erdanschluss immer zuerst angeschlossen und als letztes abgetrennt wird.

Avvertenza Mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoplingssekvens er jord til jord, +RTN til +RTN, –48 V til – 48 V. Riktig frakoples tilkoplingssekvens er –48 V til – 48 V, +RTN til +RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, +RTN a +RTN, entonces –48 V a –48 V. Al desconectar potencia, la secuencia apropiada del cableado es –48 V a –48 V, +RTN a +RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.

¡Atención! Wire a fonte de alimentação de DC Usando os talões apropriados nan EXtremidade da fiação. Ao conectar a potência, a seqüência apropriada da fiação é moída para moer, +RTN a +RTN, então –48 V a –48 V. Ao desconectar a potência, a seqüência apropriada da fiação é –48 V a –48 V, +RTN a +RTN, moeu então para moer. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último.

Varning! Korrekt kopplingssekvens ar jord till jord, +RTN till +RTN, –48 V till –48 V. Korrekt kopplas kopplingssekvens ar –48 V till –48 V, +RTN till +RTN, jord till jord.

DC Power Wiring Terminations Warning

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations must be the appropriate size for the wires and must clamp both the insulation and conductor.

Waarschuwing Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

Varoitus Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

Avertissement Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

Warnung Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

Avvertenza Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcella con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

Advarsel Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

Varning! När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

Multiple Power Supplies Disconnection Warning

WARNING: The network device has more than one power supply connection. All connections must be removed completely to remove power from the unit completely.

Waarschuwing Deze eenheid heeft meer dan één stroomtoevoerverbinding; alle verbindingen moeten volledig worden verwijderd om de stroom van deze eenheid volledig te verwijderen.

Varoitus Tässä laitteessa on useampia virtalähdekytkentöjä. Kaikki kytkennät on irrotettava kokonaan, jotta virta poistettaisiin täysin laitteesta.

Avertissement Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés.

Warnung Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.

Avvertenza Questa unità ha più di una connessione per alimentatore elettrico; tutte le connessioni devono essere completamente rimosse per togliere l'elettricità dall'unità.

Advarsel Denne enheten har mer enn én strømtilkobling. Alle tilkoblinger må kobles helt fra for å eliminere strøm fra enheten.

Aviso Este dispositivo possui mais do que uma conexão de fonte de alimentação de energia; para poder remover a fonte de alimentação de energia, deverão ser desconectadas todas as conexões existentes.

¡Atención! Esta unidad tiene más de una conexión de suministros de alimentación; para eliminar la alimentación por completo, deben desconectarse completamente todas las conexiones.

Varning! Denna enhet har mer än en strömförsörjningsanslutning; alla anslutningar måste vara helt avlägsnade innan strömtillförseln till enheten är fullständigt bruten.

TN Power Warning

WARNING: The device is designed to work with a TN power system.
Waarschuwing Het apparaat is ontworpen om te functioneren met TN energiesystemen.

Varoitus Koje on suunniteltu toimimaan TN-sähkövoimajärjestelmien yhteydessä.

Avertissement Ce dispositif a été conçu pour fonctionner avec des systèmes d'alimentation TN.

Warnung Das Gerät ist für die Verwendung mit TN-Stromsystemen ausgelegt.

Avvertenza Il dispositivo è stato progettato per l'uso con sistemi di alimentazione TN.

Advarsel Utstyret er utfomet til bruk med TN-strømsystemer.

Aviso O dispositivo foi criado para operar com sistemas de corrente TN.

¡Atención! El equipo está diseñado para trabajar con sistemas de alimentación tipo TN.

Varning! Enheten är konstruerad för användning tillsammans med elkraftssystem av TN-typ.

Action to Take After an Electrical Accident

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.
2. Disconnect power from the device.

3. If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, and then call for help.

Agency Approvals

IN THIS SECTION

The firewall complies with the following standards:

- Safety
  - CAN/CSA-C22.2 No. 60950-1: Information Technology Equipment - Safety (Canada)
  - UL 60950-1: Information Technology Equipment - Safety (U.S.)
  - IEC 60950-1: Information Technology Equipment - Safety (CB Scheme)
- EMC
  - EN 300 386: Telecom Network Equipment (EMC requirements)
  - EN 55032/CISPR 32: Electromagnetic compatibility of multimedia equipment (Emission requirements)
  - EN 55022/CISPR 22: Information Technology Equipment (Emissions)
  - EN 55024/CISPR 24: Information Technology Equipment (Immunity)
  - FCC 47 CFR Part 15, Class A: U.S. Radiated Emissions
  - ICES-003, Class A: Canada Radiated Emissions
  - AS/NZS CISPR 32: Australia/New Zealand Radiated Emissions
  - VCCI-CISPR 32, Class A: Japanese Radiated Emissions
  - BSMI CNS 13438: Taiwan Radiated Emissions (at 10 Meter)
  - KN32/KN35: Korea Radiated Emissions and Immunity (at 10 Meter)

  - IEC/EN 61000: Immunity requirements
- RoHS
  - RoHS 2 Directive 2011/65/EU - Restriction on Hazardous Substances
- Telco
  - Common Language Equipment Identifier (CLEI) code
- NEBS Level 3
  - GR-63-CORE
  - GR-1089-CORE

Compliance Statement for Argentina

EQUIPO DE USO IDÓNEO.

RELATED DOCUMENTATION

Acoustic Noise Compliance Statements | 172

EMC Requirements | 173

Acoustic Noise Compliance Statements

The maximum emitted sound pressure level is 70 dB(A) or less per EN ISO 7779.

German Translation:

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70 dB(A) oder weniger gemäss EN ISO 7779.

RELATED DOCUMENTATION

EMC Requirements | 173

EMC Requirements

IN THIS SECTION

Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Community

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Israel

אזהרה

מוצר זה הוא מוצר Class A.
בסביבה ביתית,מוצר זה עלול לגרום הפרעות בתדר רדיו,ובמקרה זה ,המשתמש עשוי להידרש לנקוט אמצעים מתאימים.

The preceding translates as follows:

This product is Class A. In residential environments, the product may cause radio interference, and in such a situation, the user may be required to take adequate measures.

Japan

この装置は，クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

The preceding translates as follows:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI-A

United States

The firewall has been tested and found to comply with the limits for a Class A digital device of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RELATED DOCUMENTATION

Acoustic Noise Compliance Statements | 172