



Cisco N9348GC-FXP-ORV3 Hardware Installation Guide

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CHAPTER 1

Introduction to N9348GC-FXP-ORV3

- [Product Overview, on page 1](#)
- [LEDs, on page 5](#)

Product Overview

The Cisco N9348GC-FXP-ORV3 switch (NC9348GC-FXP-ORV3) is a 1-RU fixed-port, L2/L3 switch, designed for deployment in data centers.

- 48 100/1000-Megabit 1GBASE-T downlink ports
- 4 1/10-/25-Gigabit SFP28 downlink ports
- 2 40-/100-Gigabit QSFP28 uplink ports
- Fan modules (three) with these airflow choices:
 - Port-side intake airflow with burgundy coloring (NXA-FAN-30CFM-B)
 - Port-side exhaust airflow with blue coloring (NXA-FAN-30CFM-F)



Note This switch will power down due to a fan-policy trigger if fewer than 2 fans are operational.

Table 1: Fan Speeds for this Switch

	Port-Side Intake Fan Speed %	Port-Side Exhaust Fan Speed %
Typical/Minimum	40%	40%
Maximum	100%	100%



Note Each fan module has two rotors. The switch can function normally if one rotor inside the any one fan module fails. In case of more than one rotor failure, the switch will issue a warning and power down in 2 minute.

- Power supply modules (two—one for operations and one for redundancy [1+1]) with these choices (a mix of AC and DC power sources is supported but do not mix airflow directions):
 - 350-W AC power supply with port-side intake airflow (burgundy coloring) (NXA-PAC-350W-PI2)
 - 350-W AC power supply with port-side exhaust airflow (blue coloring) (NXA-PAC-350W-PE2)
 - 350-W PHV power supply with port-side intake airflow (burgundy coloring) (NXA-PHV-350W-PI)
 - 350-W PHV power supply with port-side exhaust airflow (blue coloring) (NXA-PHV-350W-PE)
 - 440-W DC power supply with port-side intake airflow (burgundy coloring) (NXA-PDC-440W-PI)
 - 440-W DC power supply with port-side exhaust airflow (blue coloring) (NXA-PDC-440W-PE)



Note The 350-W AC power supply does not have the standby voltage to be able to carry to a second power supply, to allow it to communicate and poll the device.

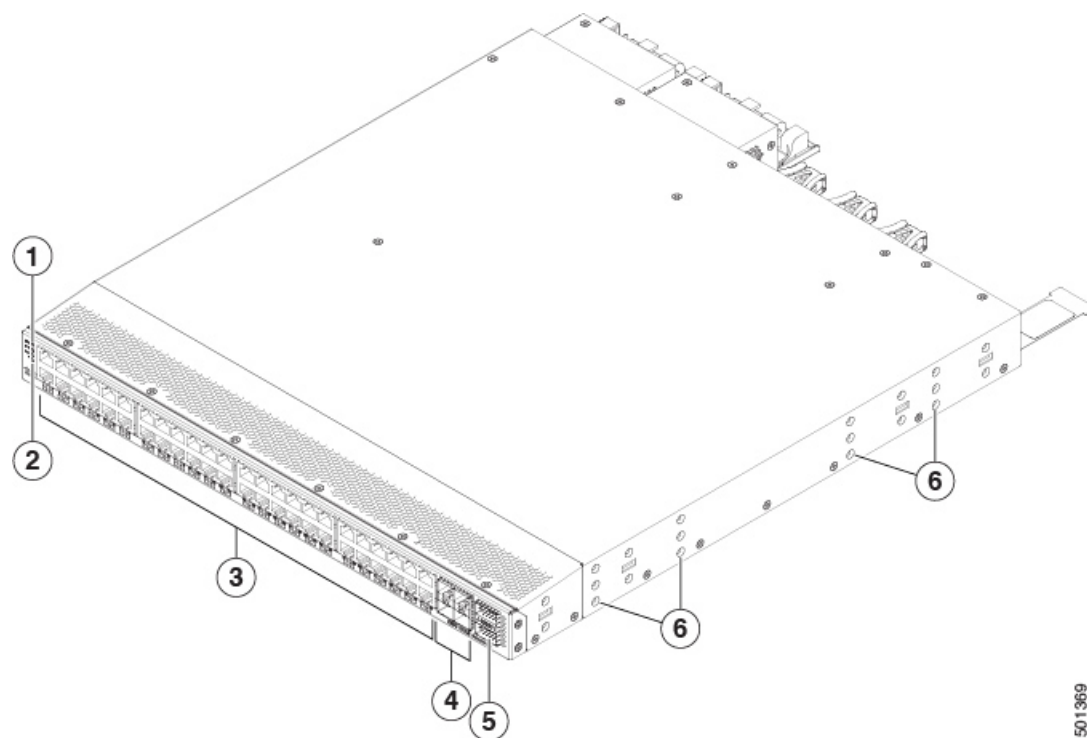
Deployment Scheme for SFP-10G-T-X Transceivers

There are 4 ports of SFP on the 9348GC-FXP switch in a 2x2 pattern. The SFP-10G-T-X module can be used in all four of these ports.

To determine which transceivers, adapters, and cables this switch supports, see the [Cisco Transceiver Modules Compatibility Information](#) document.

Front-Panel Components

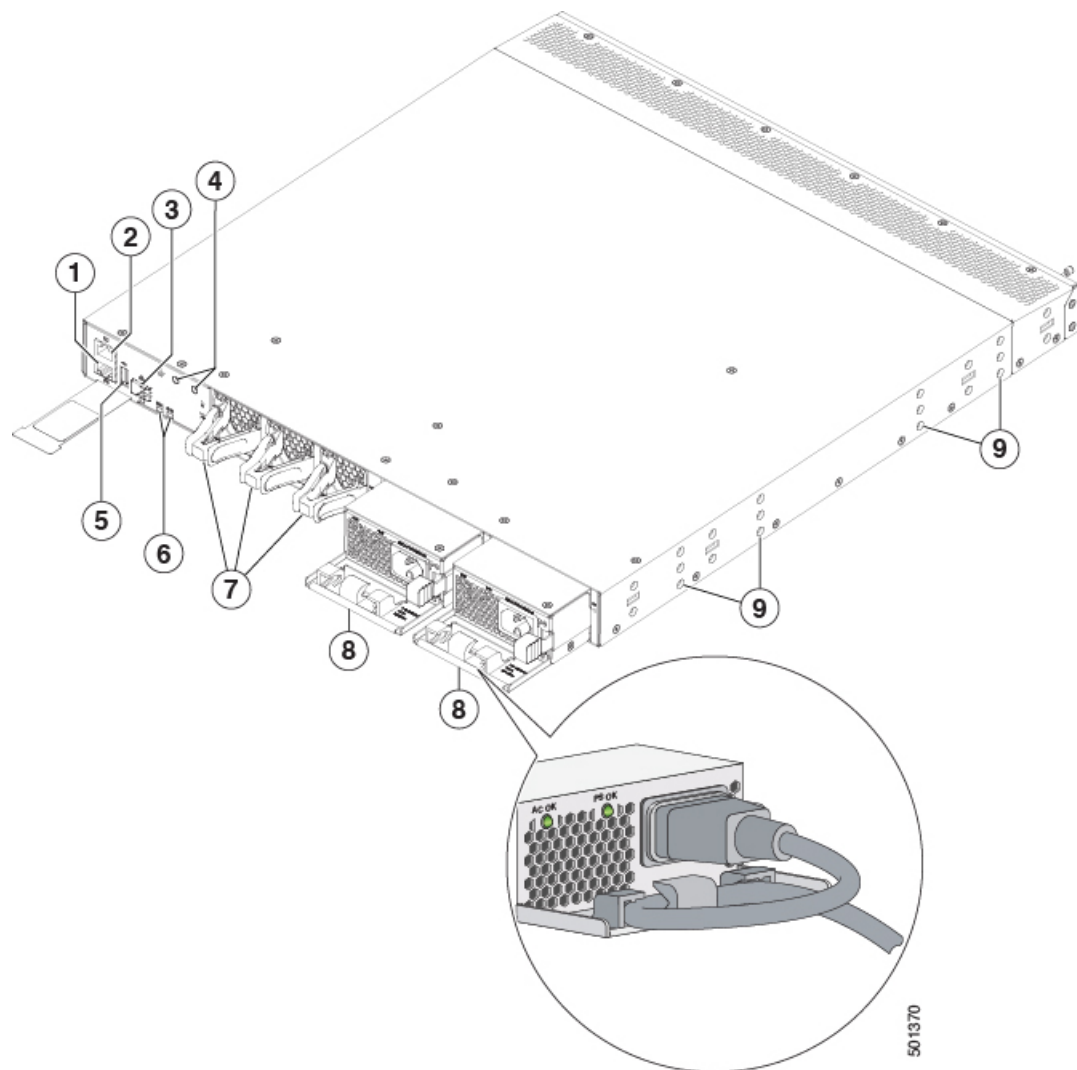
This figure shows the hardware features as seen from the port side of the chassis.



1	Chassis LEDs (Beacon [BCN], Status [STS], and Environment [ENV])	4	10-/25-Gigabit SFP28 downlink ports (4)
2	LED (P) designated for possible future use	5	40-/100-Gigabit QSFP28 uplink ports (2)
3	100-/1000-Megabit IGBASE-T downlink ports (48)	6	Screw holes (6) for attaching rack mounting brackets

Rear-Panel Components

This figure shows the hardware features as seen from the power supply side of the chassis.



1	Management port (RJ-45 port)	6	Chassis LEDs (Beacon [BCN] and Status [STS])
2	Console port (RS-232 port)	7	Fan module (3) with fan slot 1 on the left and fan slot 3 on the right
3	Management port (SFP port)	8	Power supply (2) one used for operations and one used for redundancy, with power supply slot 1 on the left and slot 2 on the right
4	Grounding pad	9	Screw holes (6) for attaching rack mounting brackets
5	USB port	-	



Note USB support is limited to USB 2.0 devices that use less than 2.5 W (less than 0.5 A inclusive of surge current). Devices, such as external hard drives, that instantaneously draw more than 0.5 A are not supported.

Depending on whether you plan to position the ports in a hot or cold aisle, you can order the fan and power supply modules with port-side intake or port-side exhaust airflow. To determine the airflow direction of the modules installed in your switch, see this table.

Replaceable Modules	Port-Side Intake Airflow Coloring	Port-Side Exhaust Airflow Coloring
Fans	Burgundy	Blue
AC power supplies	Burgundy	Blue

The fan and power supply modules are field replaceable. You can replace one fan module or one power supply module during operations, so long as the other modules are installed and operating. If you have only one power supply installed, you can install the replacement power supply in the open slot before removing the original power supply.

All of the fan and power supply modules must have the same direction of airflow. Otherwise, the switch can overheat and shut down. If you are installing a dual-direction power supply, that module automatically uses the same airflow direction as the other modules in the switch.



Caution If the switch has port-side intake airflow (burgundy coloring for fan modules), you must locate the ports in the cold aisle. If the switch has port-side exhaust airflow (blue coloring for fan modules), you must locate the ports in the hot aisle. If you locate the air intake in a hot aisle, the switch can overheat and shut down.

LEDs

This section describes the switch chassis, fan, and power supply module LEDs.

Switch Chassis LEDs

The BCN, STS, and ENV, LEDs are located on the left side of the front of the switch. The port LEDs appear as triangles pointing up or down to the nearest port.

LED	Color	Status
BCN (Beacon)	Flashing Blue	The operator has activated this LED to identify this switch in the chassis.
	Off	This switch is not being identified.

LED	Color	Status
STS (Status)	Green	The switch is operational.
	Amber	Temperature exceeds the minor alarm threshold.
	Red	Temperature exceeds the major alarm threshold.
	Flashing Amber	The switch is booting up.
	Off	The switch is not receiving power.
Env	Green	Fans and power supply modules are operational.
	Amber	At least one fan or power supply module is not operating.
	Off	No alarm
(port)	Green	Port admin state is enabled, SFP is present, and the interface is connected (that is, cabled, and the link is up).
	Amber	Port admin state is disabled, or the SFP is absent, or both.
	Off	Port admin state is enabled and SFP is present, but interface is not connected.

Fan LEDs

The fan LEDs are located below the air holes on the rear panel of the switch. This section provides information about the fan LEDs.

LED	Color	Status
Status	Green	The fan module is operating normally.
	Red	One or more fan modules are not operational.
	Off	The fan module is not receiving power.

Power Supply LEDs

The two power supply LEDs are located at the rear of the switch and on the left portion of the power supply module.

Combinations of states that are indicated by the Okay (PS_OK) and Okay (AC_OK) LEDs indicate the status for the module as described in the table.

PS_OK	AC_OK	Status Description
Green	Green	The power supply is on and sending power to the switch.
Flashing Green	Off	The power supply is connected to a power source, but not sending power to the switch. Or a power supply module may not be installed in the chassis.
Green	Flashing Amber	Power supply is operating but a warning condition has occurred—possibly one of these conditions: • High voltage • High power • Low voltage • Slow power supply fan
Green	Amber	Rotor fault Note This behavior occurs if the fan rotor is stopped during normal switch operation.
Off	Off	AC cord is removed while in redundant mode (while other power supply module is still running).



CHAPTER 2

Prepare to Install

- [Airflow Requirements, on page 9](#)
- [Altitude Requirements, on page 10](#)
- [Clearance Requirements, on page 10](#)
- [Dust and Particulate Requirements, on page 11](#)
- [Requirements to Ground the Switch, on page 11](#)
- [Humidity Requirements, on page 12](#)
- [Minimize Electromagnetic and Radio Frequency Interference, on page 12](#)
- [Plan for Power Requirements, on page 13](#)
- [Prevent Electrostatic Discharge Damage, on page 13](#)
- [Rack and Cabinet Requirements, on page 14](#)
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- [Temperature Requirements, on page 14](#)
- [Network Equipment-Building System \(NEBS\) Statements, on page 15](#)

Airflow Requirements

The switch is positioned with its ports in either the front or the rear of the rack, depending on your cabling and maintenance requirements. To identify the airflow options for your switch, see the user-replaceable components in the *Overview* section of this document. Position the fan and power supply modules to move the coolant air from the cold aisle to the hot aisle in one of these ways:

- Port-side exhaust airflow: Cool air enters the chassis through the fan and power supply modules in the cold aisle and exhausts through the port end of the chassis in the hot aisle.
 - Port-side intake airflow: Cool air enters the chassis through the port end in the cold aisle and exhausts through the fan and power supply modules in the hot aisle.
 - Single-direction airflow: The direction of the installed fan modules determines the airflow.

For port-side exhaust airflow, the N9348Y12C-SE1 switch can support QSFP-100G-SR1.2 on rows 1 and 3 at a maximum ambient temperature of 35°C and on row 2 at a maximum ambient temperature of 30°C. It can also support QSFP-100G-SM-SR and QSFP-40/100-SRBD on rows 1, 2, and 3 at a maximum ambient temperature of 35°C.

For port-side intake airflow, there is no limitation.

You can identify the airflow direction of each fan and power supply module by its coloring.



Note To prevent the switch from overheating and shutting down, position the air intake for the switch in a cold aisle. The fan and power supply modules must have the same direction of airflow. To change the airflow direction for the switch, shutdown the switch before changing the modules.

Altitude Requirements

Altitude rating is 10,000 ft (3048 m). For China, it is 6,562 ft (2000 m).

Clearance Requirements

Provide the chassis with adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the switch. Provide the chassis with adequate clearance to route cables, provide airflow, and maintain the switch.

For the clearances required for an installation of this chassis in a four-post rack, see this figure.

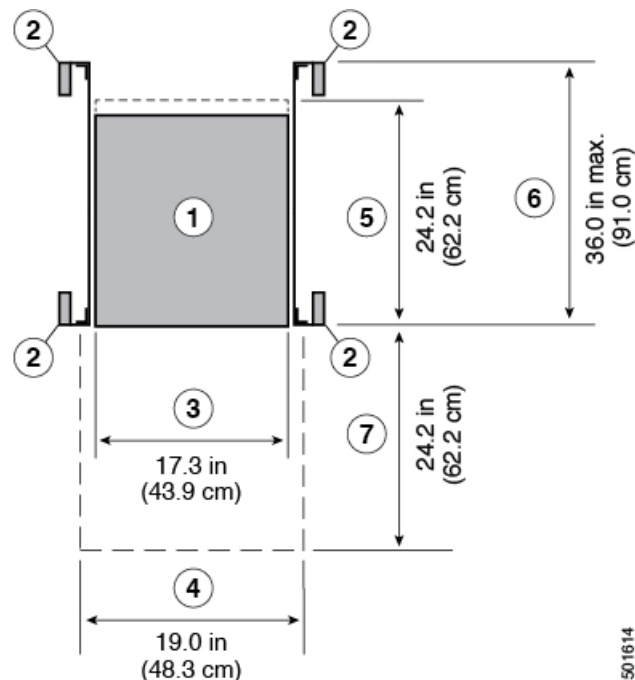


Table 2: Look up Table Title

1	Chassis	5	Depth of the chassis
2	Vertical rack-mount posts and rails	6	Maximum extension of the bottom-support rails 36.0 in (91.4 cm)

3	Chassis width 17.3 in (43.9 cm)	7	Depth of the front clearance area (equal to the depth of the chassis).
4	Width of the front clearance area (equal to the width of the chassis with two rack-mount brackets that are attached to it). 19.0 in (48.3 cm)	-	-

Dust and Particulate Requirements

Exhaust fans cool power supplies. System fans cool switches by drawing in air and exhausting air out through various openings in the chassis. Fans also introduce dust and other particles, causing contaminant buildup in the switch and increased internal chassis temperature. Dust and particles can act as insulators and interfere with the mechanical components in the switch. Keep a clean operating environment to reduce the negative effects of dust and other particles.

In addition to keeping your environment free of dust and particles, use these precautions to avoid contamination of your switch:

- Do not smoke near the switch.
- Do not eat or drink near the switch.

Requirements to Ground the Switch

The switch is sensitive to variations in voltage that is supplied by the power sources. Overvoltage, undervoltage, and transients (spikes) can erase data from memory or cause components to fail. To protect against these types of problems, ensure that there is an earth-ground connection for the switch.

Connect the grounding pad on the switch either directly to the earth-ground connection or to a fully bonded and grounded rack.

When the chassis is properly installed in a grounded rack, the switch is grounded because it has a metal-to-metal (no paint, stain, dirt, or anything else on it) contact to the rack. See Note to ensure proper conductivity between rack and switch is maintained.

Alternatively, ground the chassis by using a customer-supplied grounding cable that meets your local and national installation requirements. For U.S. installations, we recommend 6-AWG wire. Connect your grounding cable to the chassis with a grounding lug (provided in the switch accessory kit) and to the facility ground.



Note Create an electrical conducting path between the product chassis and the metal surface of the enclosure, or rack in which it is mounted, or to a grounding conductor. Provide electrical continuity by using thread-forming type mounting screws that remove any paint or non-conductive coatings and establish a metal-to-metal contact. Remove any paint or other non-conductive coatings on the surfaces between the mounting hardware and the enclosure or rack. Clean the surfaces and apply an antioxidant before installation.

Humidity Requirements

High humidity can cause moisture to enter the switch. Moisture can cause corrosion of the internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. The switch is rated to withstand from 5% to 90% (nonoperating) and 5% to 90% (operating) relative humidity.

Climate-controlled buildings usually maintain an acceptable level of humidity for the switch equipment. If the switch is located in an unusually humid location, use a dehumidifier to maintain the humidity within an acceptable range.

Minimize Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from the switch can adversely affect other devices, such as radio and television (TV) receivers. Radio frequencies that emanate from the switch can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the switch monitor.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the switch to other devices through the power cable and power source or through the air as transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI that are emitted by computing equipment. Each switch meets these FCC regulations.

To reduce the possibility of EMI and RFI, use these guidelines:

- Cover all open expansion slots with a blank filler plate.
- Always use shielded cables with metal connector shells for attaching peripherals to the switch.

When wires are run for any significant distance in an electromagnetic field, interference can occur to the signals on the wires with these implications:

- Bad wiring can result in radio interference emanating from the plant wiring.
- Strong EMI, especially when it is caused by lightning or radio transmitters, can destroy the signal drivers and receivers in the chassis and even create an electrical hazard by conducting power surges through lines into equipment.



Note To predict and prevent strong EMI, consult experts in radio frequency interference (RFI).

The wiring is unlikely to emit radio interference if you use a twisted-pair cable with a good distribution of grounding conductors. Copper cables should not be longer than maximum distances for the media type.



Note If the wires exceed the recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse that is caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic switches. Consult experts in electrical surge suppression and shielding if you have had similar problems in the past.

Plan for Power Requirements

The switch includes two power supplies (1-to-1 redundancy with current sharing) in one of these combinations:

- Two 650-W AC power supplies
- Two 930-W DC power supplies
- Two 1200-W HVAC power supplies



Note Both power supplies must be of the same type. Do not mix AC and DC power supplies in the same chassis.



Note For 1+1 redundancy, you must use two power sources and connect each power supply to a separate power source.

The power supplies are rated to output up to 650W AC, 930W DC, or 1200W HVAC, but the switch requires less than these amounts of power from the power supply. To operate the switch, provision enough power from the power source to cover the requirements of both the switch and a power supply. Typically, this switch and a power supply require about 275 W of power input from a power source. But, provision as much as 490 W power input from the power source to cover peak demand.



Note Some of the power supply modules have rating capabilities that exceed the switch requirements. When calculating your power requirements, use the switch requirements to determine the amount of power that is required for the power supplies.

To minimize the possibility of circuit failure, verify that each power-source circuit that is used by the switch is dedicated to the switch.



Warning **Statement 1005—Circuit Breaker**

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

- 30A when the switch is powered with regular DC power supplies (rated 48-60VDC).
-

Prevent Electrostatic Discharge Damage

Many switch components can be damaged by static electricity. Not exercising the proper electrostatic discharge (ESD) precautions can result in intermittent or complete component failures. To minimize the potential for

ESD damage, always use an ESD-preventive anti-static wrist strap (or ankle strap) and ensure that it makes adequate skin contact.



Note Check the resistance value of the ESD-preventive strap periodically. The measurement should be 1–10 megohms. Before you perform any of the procedures in this document, attach an ESD-preventive strap to your wrist and connect the leash to the chassis.

Rack and Cabinet Requirements

Install these types of racks or cabinets for your switch:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom-to-top cooling)
- Standard open four-post Telco racks

Work with your cabinet vendors to determine which of their cabinets meet these requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- Use a standard 19-inch (48.3-cm), four-post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.
- The depth of a four-post rack must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting rails (for proper mounting of the bottom-support brackets or other mounting hardware).

You must also have power receptacles that are located within reach of the power cords that are used with the switch.

Shock and Vibration Requirements

The switch has been shock- and vibration-tested for operating ranges, handling, and earthquake standards.

Temperature Requirements

The operating temperature of the switch is 32 to 104 degrees Fahrenheit (0 to 40 degrees Celsius) at sea level. For every 300 meters (1000 feet) above sea level, the maximum temperature is reduced by 1 degree Celsius. The non-operating temperature of the switch is -40 to 158 degrees Fahrenheit (-40 to 70 degrees Celsius).

Overview of Module Temperatures

Built-in, automatic sensors in all switches in the Cisco N9000 Series monitor your switch at all times. Each module (supervisor, I/O, and fabric) has temperature sensors with two thresholds: minor and major.

**Note**

For any major temperature alarms from the sensors, the switch powers down in 2 minutes. Power on the switch after fixing the temperature issue.

- Minor temperature threshold: If exceeded, a minor alarm occurs and these actions happen for all four sensors:

- System messages display.
- System sends Call Home alerts (if configured).
- System sends SNMP notifications (if configured).
- System fan speed will increment.

- Major temperature threshold: If exceeded, a major alarm occurs and these actions happen:

If the threshold is exceeded in a switching module, only that module is shut down.

For all sensors:

- System messages display.
- System sends Call Home alerts (if configured).
- System sends SNMP notifications (if configured).
- System fan speed will increment.
- If the major threshold is exceeded in a switching module, only that module is shut down.
- If the major threshold is exceeded in an active supervisor module with HA-standby or standby present, only that supervisor module is shut down and the standby supervisor module takes over.
- If you do not have a standby supervisor module in your switch, you have 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages every 10 seconds, as configured.

Network Equipment-Building System (NEBS) Statements

The regulatory compliance statements and requirements for the Network Equipment Building System (NEBS) certification are listed here.

**Warning**

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

**Warning**

Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

**Note**

This equipment may be ESD sensitive. Always use an ESD ankle or wrist strap before handling equipment. Connect the equipment end of the ESD strap to an unfinished surface of the equipment chassis or to the ESD jack on the equipment if provided.

**Warning****Statement 7003**—Shielded Cable Requirements for Intrabuilding Lightning Surge

The intrabuilding port(s) of the equipment or subassembly must use shielded intrabuilding cabling/wiring that is grounded at both ends.

The following port(s) are considered intrabuilding ports on this equipment: RJ-45 Management Ethernet port.

**Note****Statement 7004**—Special Accessories Required to Comply with GR-1089 Emission and Immunity Requirements

To comply with the emission and immunity requirements of GR-1089, shielded cables are required for the following ports: Copper RJ-45 Ethernet Management port.

**Warning****Statement 7005**—Intrabuilding Lightning Surge and AC Power Fault

The intrabuilding port(s) of the equipment or subassembly is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding port(s) of the equipment or subassembly **MUST NOT** be metalically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intrabuilding interfaces only (Type 2, 4, or 4a ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metalically to an OSP wiring system.

The following ports are considered intrabuilding ports on the equipment: RJ-45 Ethernet Management port.

**Warning**

Connect this equipment to AC mains that are provided with a surge protective device (SPD) at the service equipment that complies with NFPA 70, the National Electrical Code (NEC).

**Note**

This equipment is suitable for installations using the CBN.



Note When you use thread-forming screws to bond equipment to its mounting metalwork, remove any paint and nonconductive coatings and clean the joining surfaces. Apply an antioxidant compound before joining the surfaces between the equipment and mounting metalwork.



Note **Statement 7016—Battery Return Conductor**
Treat the battery return conductor of this equipment as DC-I.



Note The equipment is designed to boot up in less than 30 minutes provided the neighboring devices are fully operational.



Note This equipment is suitable for installation in network telecommunications facilities.



Note This equipment is suitable for installation in locations where the NEC applies.



CHAPTER 3

Install the Switch Chassis

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Safety

Before you install, operate, or service the switch, see the Regulatory, Compliance, and Safety Information for the Cisco N9000 Series content for important safety information



Warning

IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number at the beginning of each warning statement to locate its translation in the translated safety warnings for this device.

SAVE THESE INSTRUCTIONS





Note You are strongly advised to read the safety instruction before using the product.

<https://www.cisco.com/web/JP/techdoc/pldoc/pldoc.html>

When installing the product, use the provided or designated connection cables/power cables/AC adapters.

〈製品使用における安全上の注意〉

www.cisco.com/web/JP/techdoc/index.html

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Warning To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.



Caution To prevent loss of input power, ensure the total maximum loads on the circuits supplying power to the switch are within the current ratings for the wiring and breakers.



Note For AC input application, please refer to the statement below.



Warning **Statement 1005—Circuit Breaker**

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: 20A (North America), 16A (Europe), and 13A (UK).

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in 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 devices, install the stabilizers before mounting or servicing the unit in the rack.

**Warning**

This unit is intended for installation in restricted access areas. Only skilled, instructed, or qualified personnel can access a restricted access area.

**Warning**

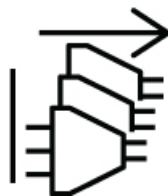
To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

**Warning**

This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

**Warning**

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.

**Warning**

To reduce the risk of electric shock, connect the unit *only* to a DC power source that complies with the SELV requirements in the IEC 60950-based safety standards or the ES1 requirements in the IEC 62368-based safety standards.

**Warning**

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules, such as power supplies, fans, or cards. These types of handles are not designed to support the weight of the unit.

**Warning**

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

**Warning**

Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.

**Warning**

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

**Note**

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

**Warning**

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed person or skilled person.

Install options with rack-mount kits

The rack-mount kit enables you to install the switch into racks of varying depths. Position the switch with easy access to either the port connections or the fan and power supply modules.

Install the switch using these rack-mount options.

- Rack-mount kit (NXX-ACC-KIT-1RU) which you can order from Cisco. This option offers you easy installation, greater stability, increased weight capacity, added accessibility, and improved removability with front and rear removal.
 - When installing the NXX-ACC-KIT-1RU rack-mount kit, the distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 25.37 to 33 inches (64.43 to 83.82 cm) to allow for rear-bracket installation.
- Rack-mount kit (N3K-C3064-ACC-KIT) which you can order from Cisco.
 - When installing the N3K-C3064-ACC-KIT rack-mount kit, the distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 22 to 30 inches (55.88 to 76.2 cm) to allow for rear-bracket installation.

The rack or cabinet that you use must meet the requirements listed the in *General Requirements for Cabinets and Racks* section.



Note You are responsible for verifying that your rack and rack-mount hardware comply with the guidelines that are described in this document.

Airflow considerations

The switch comes with fan and power supply modules that have either port-side intake or port-side exhaust airflow for cooling the switch.

If you are positioning the port end of the switch in a cold aisle, verify that the switch has port-side intake fan modules with burgundy coloring. If you are positioning the fan and power supply modules in a cold aisle, verify that the switch has port-side exhaust fan modules with blue colorings. All fan modules must have the same direction of airflow.

Guidelines to install the switch

When installing the switch, follow these guidelines.

- Ensure that there is adequate clearance space around the switch to allow for servicing the switch and for adequate airflow.
- Ensure that you are positioning the switch in a rack so that it takes in cold air from the cold aisle and exhausts air to the hot aisle. If there is blue coloring on the fan modules, the switch is configured for port-side exhaust airflow and you must position the module side of the switch in a cold aisle. If there is burgundy coloring on the fan modules, the switch is configured for port-side intake airflow and you must position the port side of the switch in a cold aisle.
- Ensure that the chassis can be adequately grounded. If the switch is not mounted in a grounded rack, we recommend connecting the system ground on the chassis directly to an earth ground.
- Ensure that the site power meets the power requirements for the switch. If available, use an uninterruptible power supply (UPS) to protect against power failures.



Note Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with the switch, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. Typically, this often requires one or both of these:
 - AC power supplies typically require at least a 15-A or 20-A AC circuit, 100 to 240 VAC, and a frequency of 50 to 60 Hz.



Note To prevent loss of input power, ensure the total maximum loads on the circuits supplying power to the switch are within the current ratings for the wiring and breakers.

Unpack and inspect the switch

Before you install a new chassis, unpack and inspect it to be sure that you have all the items that you ordered. Verify that the switch was not damaged during shipment. If anything is damaged or missing, contact your customer representative immediately.



Note When you handle the chassis or its components, follow ESD protocol at all times to prevent ESD damage. This protocol includes but is not limited to wearing an ESD wrist strap that you connect to the earth ground.



Tip Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them. If you need to move or ship the system in the future, you will need this container.

Before you begin

Before you unpack the switch and before you handle any switch components, be sure that you are wearing a grounded electrostatic discharge (ESD) strap. To ground the strap, attach it directly to an earth ground or to a grounded rack or grounded chassis (there must be a metal-to-metal connection to the earth ground).

Procedure

Step 1 Compare the shipment to the equipment list that is provided by your customer service representative. Verify that you have received all of the ordered items.

The shipment should include:

- Switch chassis
- Accessory kit
- Rack-mount kit

Step 2 Check the contents of the shipping box for damage.

Step 3 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready.

- Invoice number of the shipper (see packing slip).
- Model and serial number of the missing or damaged unit.
- Description of the problem and how it affects the installation.
- Effect of damage on the installation.

Step 4 Check to be sure that each of the power supply and the fan tray modules have the expected direction of airflow.

- Port-side intake airflow modules
 - Burgundy (fan modules and AC power supplies)
- Port-side exhaust airflow modules
 - Blue (fan modules and AC power supplies)

Note

All power supplies and fan modules must have the same direction of airflow.

Tools and equipment

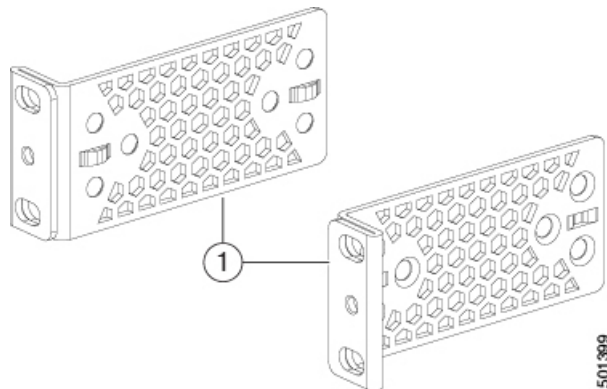
Obtain these necessary tools and equipment for installing the chassis:

- Number 1 and number 2 Phillips screwdrivers with torque capability to rack-mount the chassis.
- 3/16-inch flat-blade screwdriver.
- Tape measure and level.
- ESD wrist strap or other grounding device.
- Antistatic mat or antistatic foam.
- Crimping tool for lug.
- Wire-stripping tool.
- M4 screws to fix brackets (16).
- M4 screws to fix a ground lug (2).

Install the switch into a two-post rack

To install the switch, you must attach mounting brackets to the switch and secure the switch to the rack. Installation in racks other than 19-inch racks requires a bracket kit not included with the switch.

The following figure shows the standard 19-inch mounting brackets.



1	Standard mounting bracket for a 19-inch, two-post rack		
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Procedure

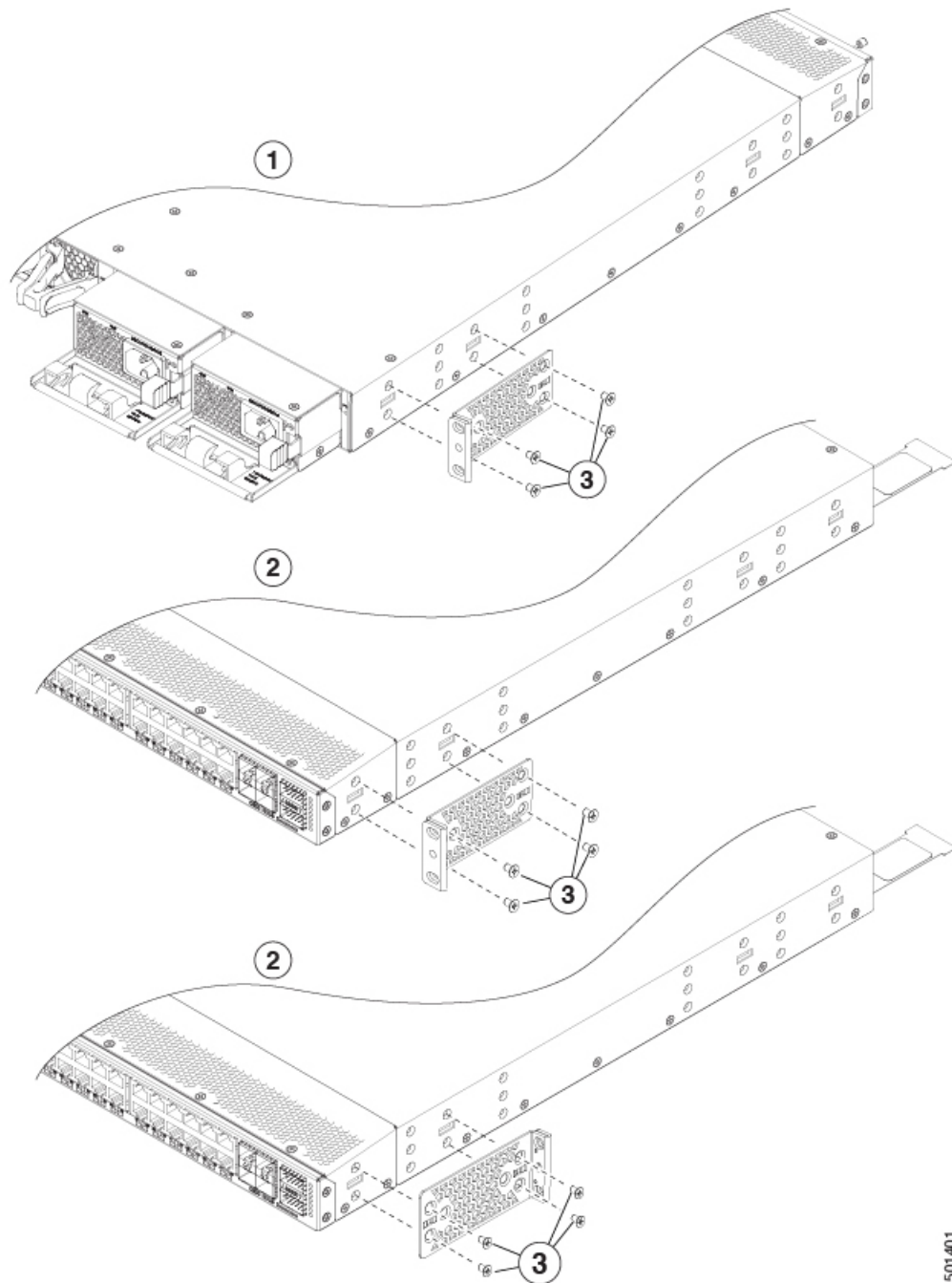
Step 1

Install the brackets to the switch.

a) Determine which end of the chassis is to be located in the cold aisle as follows:

- If the switch has port-side intake modules (fan modules with burgundy coloring), position the switch so that its ports will be in the cold aisle.
- If the switch has port-side exhaust modules (fan modules with blue coloring), position the switch so that its fan and power supply modules will be in the cold aisle.

b) Position the bracket so that four of its screw holes are aligned to the screw holes on the side of the chassis as shown in the following figure.



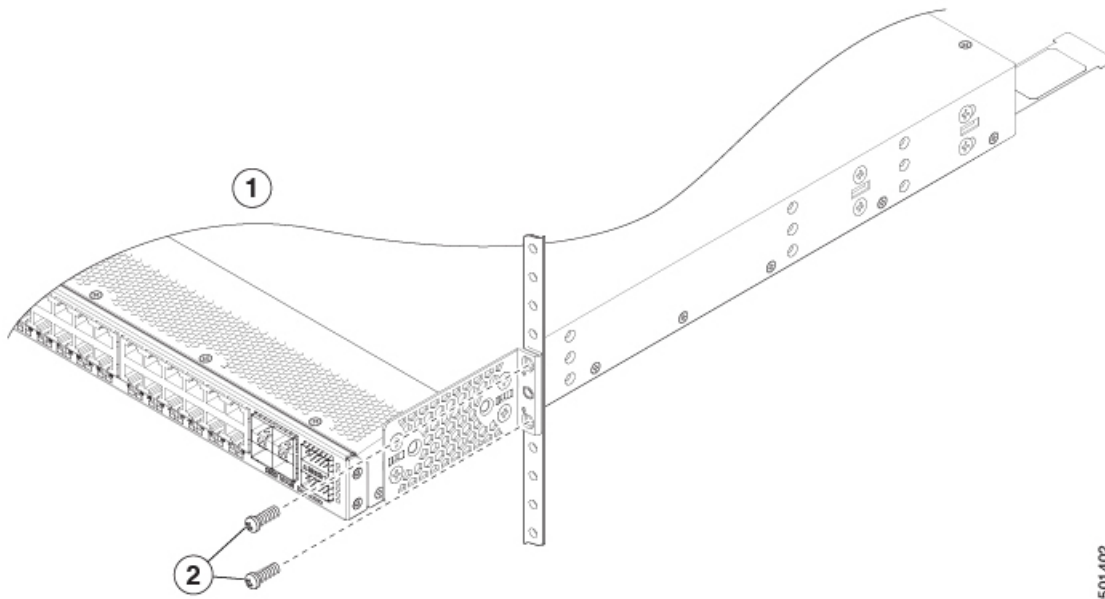
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1	Rear-mounting position	3	Number-8 Phillips flat-head screws (4 each bracket)
2	Front-mounting position	-	

- c) Secure the bracket to the chassis using four Number-8 Phillips flat-head screws and tighten each screw to 12 in-lb (1.36 N·m) of torque.
- d) Repeat previous step for the other front rack-mount bracket on the other side of the switch and be sure to position that bracket the same distance from the front of the switch.

Step 2 Install the chassis into the rack.

- a) Use two M4 screws to attach the brackets to the rack.



1	Front-mounting position	2	M4 screws (2 each side)
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Install the switch on an ORV3 rack

Open Rack Version 3 (ORV3) is a specification to build base frames for large scale deployment of racks. ORV3 adheres to the open hardware standards and is compatible with a wide range of IT equipment and facilitates interoperability with other Open Compute Project (OCP)-compliant hardware.

The N9K-9332D-GX2B-ORV3 switch is bundled or pre-installed on a tray to facilitate rack mounting the switch on ORV3 racks.

The tray with the preinstalled switch can be rack mounted on to the ORV3 rack.

Features of the switch preinstalled on the tray

To ensure that the preinstalled switch is compatible with the ORV3 rack,

- Fans and power supply modules are hot swappable.
- The serial number barcode and MAC address can be scanned.
- Option to access RJ-45 Ethernet ports from the front panel of the switch.
- A converter board to convert +48V busbar on the ORV3 rack to -48V.

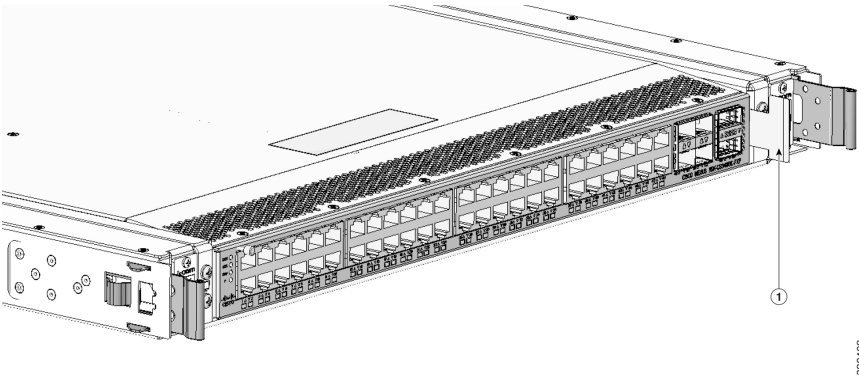
Cisco switches require -48V power source.

- Inrush current prevention inbuilt into the power supply modules and converter boards to limit electric current spikes.

Pictorial representation of the preinstalled switch

This illustration displays the pullout for scanning the serial number.

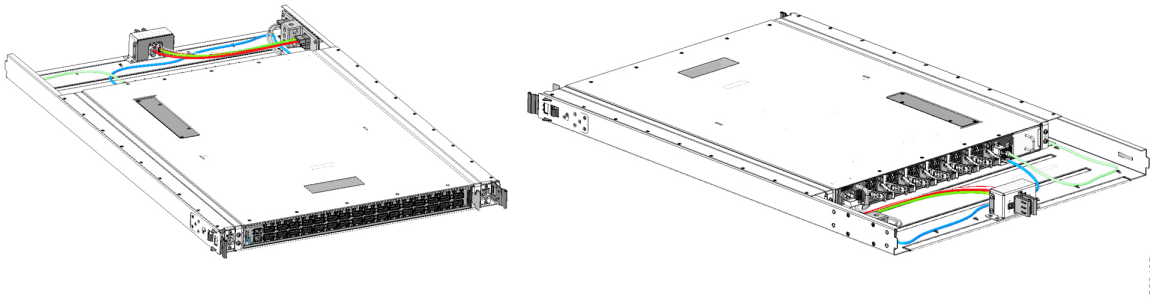
Figure 1: Pullout for scanning the serial number



1	Pullout for scanning the switch serial number	-	-
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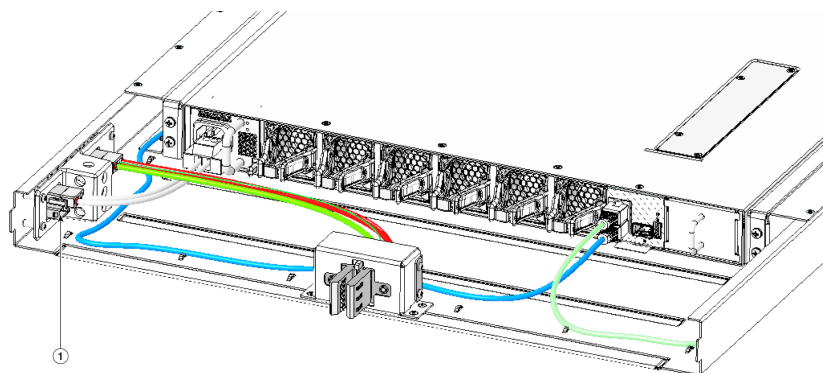
This illustration displays the front view of the switch preinstalled on an ORV3 tray. Four captive screws secure the switch to the tray.

Figure 2: Front view of the switch preinstalled on an ORV3 tray



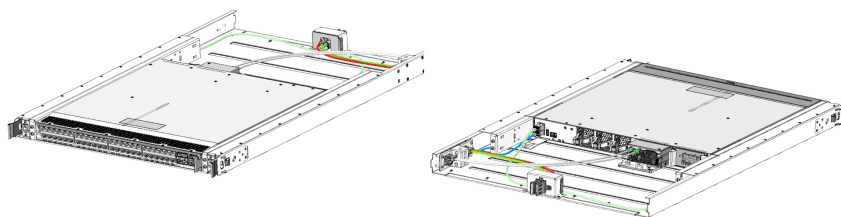
This illustration displays the rear view of the switch preinstalled on a tray.

Figure 3: Rear view of the preinstalled switch



38594.06

1	RJ-45 connector	-	-
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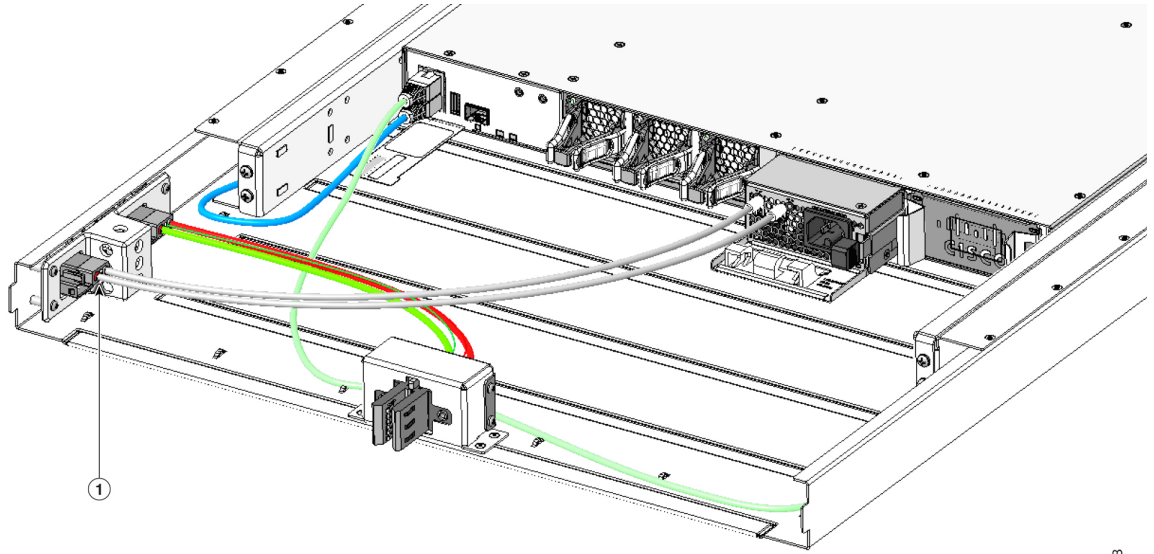


38594.07

You must unplug the left power supply cable and push up the right power supply cables to remove the left power supply unit.

This illustration displays the placement of RJ-45 Ethernet ports and RJ-45 cables that connect the ports.

Figure 4: Placement of the RJ-45 Ethernet ports and cables



1	RJ-45 cables
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Install the airflow sleeve (N9K-AIRFLOW-SLV)

Install the airflow sleeve (N9K-AIRFLOW-SLV) to allow proper airflow, so that the switch is properly cooled. This airflow sleeve is only compatible with rack mount kit (N3K-C3064-ACC-KIT).

Table 3: Minimum and maximum rack rail depth

Chassis	Minimum rack rail depth	Maximum rack rail depth
N9K-C9348GC-FXP	672.49 mm	764.29 mm



Note You supply the screws to mount the airflow sleeve.

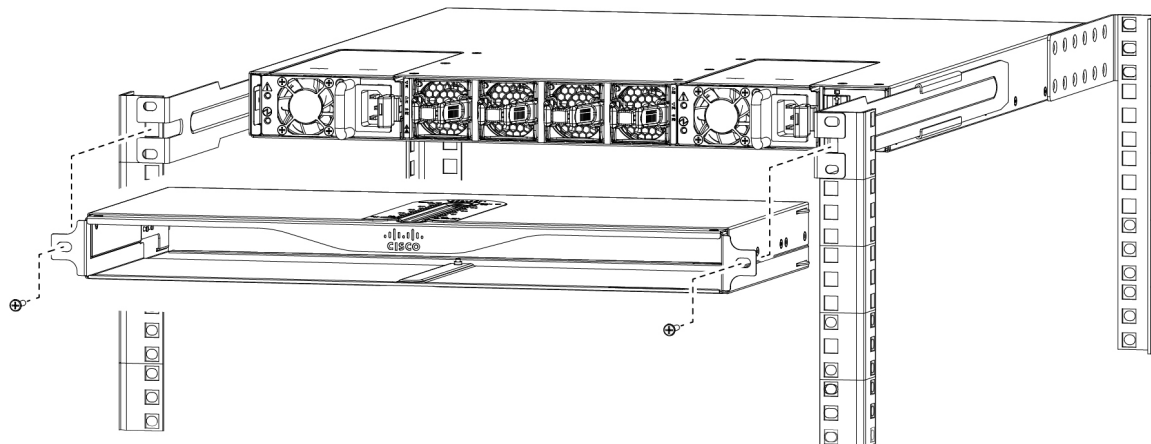
Before you begin

- Verify that your shipment is complete.
- Install your rack in a secure location.

Procedure

Insert the airflow sleeve into the rack and attach it.

- a) Holding the airflow sleeve (N9K-AIRFLOW-SLV) with both hands, position it in front of the fan side of the chassis.
- b) Holding the airflow sleeve level, insert screws (12-24 or 10-32, depending on the rack type) in each of the two front rack-mount flanges (using a total of two screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails (see the figure).



- c) Tighten the 10-32 screws to 20 in-lb (2.26 N·m) or tighten the 12-24 screws to 30 in-lb (3.39 N·m) of torque.

Ground the chassis

The switch chassis is automatically grounded when you properly install the switch in a grounded rack with metal-to-metal connections between the switch and rack.



Note Provide an electrical conducting path between the product chassis and the metal surface of the enclosure or rack in which it is mounted or to a grounding conductor. To ensure electrical continuity, use thread-forming type mounting screws that remove any paint or non-conductive coatings and establish a metal-to-metal contact. Remove any paint or other non-conductive coatings on the surfaces between the mounting hardware and the enclosure or rack. Clean the surfaces and apply an antioxidant before installation.

If using AC or HVDC power supplies, the power cord for the AC power supplies provides grounding for the chassis. For supplemental grounding or bonding, attach a customer-supplied grounding cable to the chassis ground pad.

Ground the chassis. If you are using a 2-post rack, attach a customer-supplied grounding cable. Attach the cable to the chassis grounding pad and the facility ground. If you are using a 4-post rack, ensure that your chassis is grounded through the rack mount system or the power cable (AC or HVDC).



Warning This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.



Warning To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

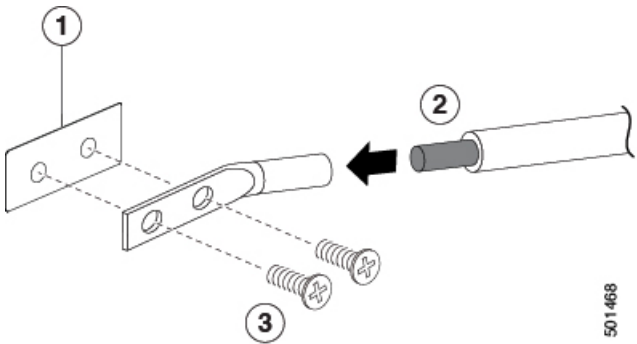
If your unit has modules, secure them with the provided screws.

Before you begin

Before you can ground the chassis, verify the earth ground contact has a solid connection to the data center building.

Procedure

- Step 1** Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire. We recommend 6-AWG wire for the U.S. installations.
- Step 2** Insert the stripped end of the grounding wire into the open end of the grounding lug. Use a crimping tool to crimp the lug to the wire. See the figure. Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug (tug test).



1	Chassis grounding pad	3	2 M4 screws are used to secure the grounding lug to the chassis
2	Grounding cable, with 0.75 in. (19 mm) of insulation that is stripped from one end, which is inserted into the grounding lug and crimped in place		

- Step 3** Secure the grounding lug to the chassis grounding pad with two M4 screws, see figure 1. Tighten the screws to 11 to 15 in-lb (1.24 to 1.69 N m) of torque.
- Step 4** Prepare the other end of the grounding wire and connect it to the facility ground.

Start the switch

Start the switch by connecting it to its dedicated power source. If you need n+n redundancy, connect each power supply in a switch to a different power source.



Note This equipment is designed to boot up in less than 30 minutes, dependent on its neighboring devices being fully up and running.

Before you begin

- The switch must be installed and secured to a rack or cabinet.
- The switch must be adequately grounded.
- The rack must be close enough to the dedicated power source so that you can connect the switch to the power source by using the designated power cables.
- You have the designated power cables for the power supplies that you are connecting to the dedicated power sources.



Note Depending on the outlet receptacle on your AC power distribution unit, you might need an optional jumper power cord to connect the switch to your outlet receptacle.

- The switch is not connected to the network (this includes any management or interface connections).
- The fan and power supply modules are fully secured in their chassis slots.

Procedure

Step 1 For the AC power supply, do this:

- a. Using the recommended AC power cable for your country or region, connect one end to the AC power supply.
- b. Connect the other end of the power cable to the AC power source.

Step 2 For any HVAC/HVDC power supply, connect it to a power source.

- Using the recommended high voltage power cable for your country or region, connect the Anderson Power Saf-D-Grid connector on the power cable to the power receptacle on the power supply. Make sure that the connector clicks when fully pushed into the receptacle.
- Connect the other end of the power cable to a power source.
 - Verify that the power is turned off at a circuit breaker for the power source terminals.
 - Remove the nuts from each of the terminal posts for the power supply.
 - Place the power cable negative-wire terminal ring on the negative terminal for the power source and secure them with a terminal nut.
 - Place the power cable positive-wire terminal ring on the positive terminal for the power source and secure them with a terminal nut.
 - Place the power cable ground-wire terminal ring on the ground terminal for the power source and secure them with a terminal nut.

- If there is a safety cover for the power source terminals, place and secure it over the terminals to avoid an electrical shock hazard.
- Turn on the power at the power source circuit breaker.

Step 3 For any DC power supply

- Turn off the circuit breaker for the power source to avoid an electrical shock hazard.
- Verify that the power cable wires from the power source are connected to a connector block.
- Insert the connector block into the receptacle on the power supply. Make sure that the connector block clicks when fully inserted in the receptacle and does not pull out.
- If there is a safety cover for the terminals, place and secure it over the terminals to avoid an electrical shock hazard.
- Turn on the power at the circuit breaker for the DC power source.

Step 4 Verify that the power supply LED is on and green.**Step 5** Listen for the fans; they should begin operating when the power supply is powered.**Step 6** After the switch boots, verify that the following LEDs are lit.

- On the fan modules, the Status (STA or STS) LED is green.
If a fan module Status LED is not green, try reinstalling the fan module.
- After initialization, the switch chassis Status (labeled as STA or STS) LED is green.

Step 7 Verify that the system software has booted and the switch has initialized without error messages.

A setup utility automatically launches the first time that you access the switch and guides you through the basic configuration. For instructions on how to configure the switch and check module connectivity, see the appropriate Cisco N9000 Series Configuration Guides.



CHAPTER 4

Connect the Switch to the Network

- [Overview of network connections, on page 37](#)
- [Prepare for network connections, on page 37](#)
- [Connect a console to the switch, on page 38](#)
- [Set up the management interface, on page 39](#)
- [Connect interface ports to other devices, on page 39](#)

Overview of network connections

After you install the switch in a rack and power it up, make these network connections:

- **Console connection**—This is a direct local management connection that you use to initially configure the switch. Make this connection first to initially configure the switch and determine its IP address, which is needed for the other connections.
- **Management connection**—After you complete the initial configuration using a console, make this connection to manage all future switch configurations.
- **Uplink and downlink interface connections**—These are connections to hosts and servers in the network.

Each of these connection types is explained in one of these sections.



Note When running cables in overhead or subfloor cable trays, we strongly recommend that you locate power cables and other potential noise sources as far away as practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 feet (1 meter), we recommend that you shield any potential noise sources by housing them in a grounded metallic conduit.

Prepare for network connections

When preparing your site for network connections to your switch, consider the types of interfaces and gather all the required equipment before connecting the ports.

- Cabling required for each interface type.
- Distance limitations for each signal type.

- Additional interface equipment required.

Connect a console to the switch

Before you create a network management connection for the switch or connect the switch to the network, create a local management connection through a console terminal. Then configure an IP address for the switch. Use the console to perform these functions, each of which can be performed through the management interface after you make that connection.

- Configure the switch using the command-line interface (CLI).
- Monitor network statistics and errors.
- Configure SNMP agent parameters.
- Download software updates.



Note We recommend that you use this port to create a local management connection to set the IP address and other initial configuration settings before connecting the switch to the network for the first time.

The console port on the switch is an RS-232 port with an RJ-45 interface. This is an asynchronous (async) serial port; any device connected to this port must be capable of asynchronous transmission.



Caution The console port can be used to connect to a modem. If you do not connect it to a modem, connect it either before powering the switch on or after the switch has completed the boot process.

Before you begin

Before you connect the switch to a console, ensure that the computer terminal that supports VT100 terminal emulation. The terminal emulation software (such as HyperTerminal or Procomm Plus) makes communication between the switch and a computer possible during setup and configuration.

Procedure

-
- Step 1** Configure the console device to match these default port characteristics.
- 9600 baud
 - 8 data bits
 - 1 stop bit
 - No parity
- Step 2** Connect the DB-9 connector on the other end of the cable to the computer serial port.
-

Set up the management interface

The switch must be powered on.

To prevent an IP address conflict, you must complete the initial configuration and establish an IP address for the switch.

Procedure

-
- Step 1** Connect the management cable into the management port on the switch. For shorter connections, you can use a cable with RJ-45 connectors.
- Step 2** Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.
-

Connect interface ports to other devices

After you perform the initial configuration for the switch and create a management connection, you are ready to connect the interface ports on the switch to other devices. Depending on the types of interface ports on the switch, use interface cables with QSFP28, QSFP+, SFP+, SFP transceivers, or RJ-45 connectors to connect the switch to other devices.

The transceivers used with many fiber-optic cables come separated from their cables. To prevent damage to the fiber-optic cables and their transceivers, we recommend that you keep these transceivers disconnected from their fiber-optic cables when installing the transceiver in the interface port. Before removing a transceiver for a fiber-optic cable, you must remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables, do the following:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers.
The switch is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be kept below 0.35 dB.
- Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

To determine which transceivers, adapters, and cables are supported by this switch, refer to the [Cisco Transceiver Modules Compatibility](#) document.

**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Install QSFP+ transceivers

The QSFP+ transceiver module can have either a bail-clasp latch or a pull-tab latch.

**Caution**

The QSFP+ transceiver module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling QSFP+ transceiver modules or coming into contact with system modules

Procedure

-
- Step 1** Attach an ESD wrist strap to yourself and a properly grounded point on the chassis or the rack. Follow the instructions for use.
- Step 2** Remove the QSFP+ transceiver module from its protective packaging.
- Step 3** Remove the dust cover from the port end of the transceiver module.
- Step 4** Check the label on the QSFP+ transceiver module body to verify that you have the correct model for your network.
- Step 5** For optical QSFP+ transceivers, remove the optical bore dust plug and set it aside.
- Step 6** For transceivers equipped with a bail-clasp latch, do the following
- Keep the bail-clasp aligned in a vertical position.
 - Align the QSFP+ transceiver in front of the module's transceiver socket opening and carefully slide the QSFP+ transceiver into the socket until the transceiver makes contact with the socket electrical connector.
- Step 7** For QSFP+ transceivers equipped with a pull-tab, do the following:
- Hold the transceiver so that the identifier label is on the top.
 - Align the QSFP+ transceiver in front of the module's transceiver socket opening and carefully slide the QSFP+ transceiver into the socket until the transceiver makes contact with the socket electrical connector.
-



CHAPTER 5

Replace Components

- [Replace a Fan Module, on page 41](#)
- [Replace a Power Supply Module, on page 42](#)

Replace a Fan Module

You can replace a fan module while the switch is operating, as long as you perform the replacement within one minute. If you cannot perform the replacement within one minute, leave the original fan module in the chassis to maintain the designed airflow until you have the replacement fan module on hand and can perform the replacement.



Caution

If you are replacing a module during operations, verify the replacement fan module has the correct direction of airflow. This means that it has the same airflow direction as the other modules in the chassis. Also, verify that the airflow direction takes in air from a cold aisle and exhausts air to a hot aisle. Otherwise, the switch can overheat and shutdown.

If you are changing the airflow direction of all the modules in the chassis, shutdown the switch before replacing all the fan and power supply modules with modules using the other airflow direction. During operations, all of the modules must have the same direction of airflow.

Remove a Fan Module



Caution

The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

Procedure

Step 1

On the fan module that you are removing, press the two sides of the fan module handle together, and pull on the handles enough to unseat it from its connectors.

Step 2 Holding the handle, pull the module out of the chassis.

Caution

Do not touch the electrical connectors on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Install a Fan Module

Before you begin

- A fan slot must be open and ready for the new fan module to be installed.
- If the switch is operating, you must have a new fan module on hand and ready to install within one minute of removing the original fan module.
- The new fan module must have the same airflow direction as the other fan and power supply modules installed in the switch.

Procedure

- Step 1** Holding the fan module by its handle, align the back of the fan module (the side with the electrical connectors) to the open fan slot in the chassis.
- Step 2** Slide the fan module into the slot until it clicks in place.
- Step 3** Verify that the Status (STS) LED switches on and becomes green.
-

Replace a Power Supply Module

The switch requires two power supplies for redundancy. With one power supply providing the necessary power for operations, replace the other power supply during operations as long as the new power supply has the same airflow direction as the other modules in the chassis.

Replace a power supply with another supported power supply that has the same power source type as the other installed power supply. Additionally, the airflow direction of the power supply must match or conform to the airflow direction of the installed fan modules.

Replace an AC Power Supply

Replace an AC power supply during operations as long as the other power supply provides power to the switch.

Before you begin



Note Determine the airflow direction by looking at the coloring of the latch on each power supply. AC power supplies with burgundy latches have port-side intake airflow direction. AC power supplies with blue latches have port-side exhaust airflow direction.

- The replacement power supply must have the same wattage and airflow direction as the power supply being replaced.
- An AC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using n+n power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis that you are installing the replacement module. AC power supplies connected to AC power sources are automatically grounded through their power cable.

Procedure

Step 1 Remove the AC power supply.

- a. Holding the plug for the power cable, pull the plug out from the power receptacle on the power supply and verify that both power supply LEDs are off.
- b. Grasp the power supply handle while pressing the colored release latch towards the power supply handle.
- c. Place your other hand under the power supply to support it while you slide it out of the chassis.

Step 2 Install the replacement power supply.

- a. Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note

If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

- b. Test the installation by trying to pull the power supply out of the slot without using the release latch.
If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.
- c. Attach the power cable to the electrical outlet on the front of the power supply.
- d. Make sure that the other end of the power cable is attached to the appropriate power source for the power supply.

Note

Depending on the outlet receptacle on your power distribution unit, you might need the optional jumper cable to connect the switch to your outlet receptacle.

- e. Verify that the power supply is operational by making sure that the power supply LED is green.

Replace a High Voltage AC Power Supply

Replace an HVAC power supply during operations as long as the other power supply provides power to the switch.

Before you begin

- The replacement power supply must have the same wattage and airflow direction as the power supply being replaced.
- An HVAC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using n+n power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis in which you are installing the replacement power supply. HVAC power supplies connected to AC power sources are automatically grounded by their power cable when connected to the power supply and AC power source. HVAC power supplies connected to DC power sources have Saf-D-Grid power cables with three connectors on the power source end—you connect one of those connectors to the earth ground.

Procedure

Step 1 Remove an HVAC power supply.

- a. Turn off the circuit breaker for the power feed to the power supply that you are replacing.
Be sure that the LEDs turn off on the power supply that you are removing.
- b. Remove the power cable from the power supply by pressing the tab on the top of the Anderson Power SAF-D-Grid connector and pull the cable and connector out of the power supply.
- c. Grasp the power supply handle while pressing the colored release latch towards the power supply handle.
- d. Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution

Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2 Install the replacement power supply.

- a. Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note

If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

- b. Test the installation by trying to pull the power supply out of the slot without using the release latch.
If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.
- c. Attach the Saf-D-Grid end of the power cable to the electrical outlet on the front of the power supply.
- d. Make sure that the other end of the power cable is attached to the appropriate power source for the power supply.
 - For an HVAC power source, plug the other end of the power cable into the power source.
 - For a HVDC power source, verify that the circuit breaker is turned off and then connect each of the three cable connectors to the appropriate DC and grounding terminals on the power source. If there is a cover plate for the DC terminals, install the plate to prevent accidental contact with the terminals.
- e. If using an HVDC power source, turn on the circuit breaker for the power source.
- f. Verify that the power supply is operational by making sure that the power supply LED is green.

Replace a DC Power Supply

Replace a DC power supply during operations so long as the other power supply provides power to the switch.

Before you begin

- Replace a power supply with the same wattage and airflow direction as the power supply being replaced.



Note Determine the airflow direction by looking at the coloring of the latch on each power supply. DC power supplies with burgundy latches have port-side intake airflow direction. DC power supplies with blue latches have port-side exhaust airflow direction.

- A DC power source must be within reach of the power cables that will be used with the replacement power supply. If you are using n+n power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis in which you are installing the replacement power supply. If the switch is mounted properly in a grounded rack then there is no need to ground the PSU. Some DC power supplies like NXA-PDC-930W-PI, connected to DC power sources have three power cables (two for DC power and one for grounding).
- We recommend 8-AWG wire for DC installation in the U.S.
- All DC power supplies have reverse polarity protection. When you inadvertently connect the input power (+) to the DC PSU's – terminal and the input power – to the DC PSU's (+) terminal, the PSU will not be damaged and will operate fine after the input power feeds are correctly wired.

Procedure

Step 1 Remove a DC power supply.

- a. Turn off the circuit breaker for the power feed to the power supply that you are replacing.
Be sure that the LEDs turn off on the power supply that you are removing.
- b. Remove the DC power connector block from the power supply.
 1. Push the top of the connector block inward toward the power supply.
 2. Pull the connector block out of the power supply.
- c. Grasp the power supply handle while pressing the release latch towards the power supply handle.
- d. Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution

Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2 Install the replacement power supply.

- a. Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note

If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

- b. Test the installation by trying to pull the power supply out of the slot without using the release latch.
If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.
 - c. Attach the power connector block end of the power cable to the electrical outlet on the front of the power supply.
 - d. Turn on the circuit breaker for the power source.
 - e. Verify that the power supply is operational by making sure that the power supply LED is green.
-

Replace a High Voltage AC Power Supply

Replace an HVAC power supply during operations as long as the other power supply provides power to the switch.

Before you begin

- The replacement power supply must have the same wattage and airflow direction as the power supply being replaced.

- An HVAC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using n+n power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis in which you are installing the replacement power supply. HVAC power supplies connected to AC power sources are automatically grounded by their power cable when connected to the power supply and AC power source. HVAC power supplies connected to DC power sources have Saf-D-Grid power cables with three connectors on the power source end--you connect one of those connectors to the earth ground.

Procedure

Step 1

Remove an HVAC power supply.

- a. Turn off the circuit breaker for the power feed to the power supply that you are replacing.
Be sure that the LEDs turn off on the power supply that you are removing.
- b. Remove the power cable from the power supply by pressing the tab on the top of the Anderson Power SAF-D-Grid connector and pull the cable and connector out of the power supply.
- c. Grasp the power supply handle while pressing the colored release latch towards the power supply handle.
- d. Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution

Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2

Install the replacement power supply.

- a. Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note

If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

- b. Test the installation by trying to pull the power supply out of the slot without using the release latch.
If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.
- c. Attach the Saf-D-Grid end of the power cable to the electrical outlet on the front of the power supply.
- d. Make sure that the other end of the power cable is attached to the appropriate power source for the power supply.
 - For an HVAC power source, plug the other end of the power cable into the power source.
 - For a HVDC power source, verify that the circuit breaker is turned off and then connect each of the three cable connectors to the appropriate DC and grounding terminals on the power source. If there is a cover plate for the DC terminals, install the plate to prevent accidental contact with the terminals.

- e. If using an HVDC power source, turn on the circuit breaker for the power source.
 - f. Verify that the power supply is operational by making sure that the power supply LED is green.
-



APPENDIX **A**

Rack Specifications

- [Overview of Racks, on page 49](#)
- [General Requirements for Cabinets and Racks, on page 49](#)
- [Requirements for Standard Open Racks, on page 50](#)
- [Requirements for Perforated Cabinets, on page 50](#)
- [Cable Management Guidelines, on page 50](#)

Overview of Racks

Install the switch in these types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104°F (0 to 40°C):

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)
- Standard open racks



Note

- If you are using an enclosed cabinet, we recommend one of the thermally validated types, either standard perforated or solid-walled with a fan tray.
- We do not recommend using racks that have obstructions (such as power strips). The obstructions could impair access to field-replaceable units (FRUs).

General Requirements for Cabinets and Racks

The cabinet or rack must meet these requirements:

- Standard 19-inch (48.3 cm) (two- or four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992). For more information, see *Requirements for Perforated Cabinets*.

The spacing between the posts of the rack must be (EIA-310-D-1992 19-inch rack compatible) wide enough to accommodate the width of the chassis.

- The minimum vertical rack space requirement per chassis is:
 - For a one RU (rack unit) switch, 1.75 inches (4.4 cm)
 - For a one and a half RU (rack unit) switch, 2.63 (6.68 cm)
 - For a two RU (rack unit) switch, 3.5 inches (8.8 cm)
 - For a three RU (rack unit) switch, 5.25 inches (13.3 cm)
- The width between the rack-mounting rails must be at least 17.75 inches (45.0 cm) if the rear of the device is not attached to the rack. For four-post EIA racks, this measurement is the distance between the two front rails.

Four-post EIA cabinets (perforated or solid-walled) must meet these requirements:

- The minimum spacing for the bend radius for fiber-optic cables should have the front-mounting rails of the cabinet offset from the front door by a minimum of 3 inches (7.6 cm).
- The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.0 to 30.0 inches (58.4 to 76.2 cm) to allow for rear-bracket installation.

Requirements for Standard Open Racks

If you are mounting the chassis in an open rack (no side panels or doors), ensure that the rack meets these requirements:

- The minimum vertical rack space per chassis must be equal to the rack unit (RU) of the chassis. One rack unit is equal to 1.75 inches (4.4 cm).
- The distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Requirements for Perforated Cabinets

A perforated cabinet has perforations in its front and rear doors and side walls. Perforated cabinets must meet these requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches (96.8 square cm) of open area per rack unit of door height.
- The roof should be perforated with at least a 20 percent open area.
- The cabinet floor should be open or perforated to enhance cooling.

The Cisco R Series rack conforms to these requirements.

Cable Management Guidelines

To help with cable management, allow additional space in the rack above and below the chassis to make it easier to route all of the fiber optic or copper cables through the rack.



APPENDIX B

System Specifications

- [Environmental Specifications, on page 51](#)
- [Switch Dimensions, on page 51](#)
- [Switch and Module Weights and Quantities, on page 52](#)
- [Transceiver and Cable Specifications, on page 52](#)
- [Switch Power Input Requirements, on page 52](#)
- [Power Specifications, on page 53](#)
- [Power Cable Specifications, on page 54](#)
- [Regulatory Standards Compliance Specifications, on page 55](#)

Environmental Specifications

	Environment	Specification
Temperature	Ambient operating temperature	32 to 104°F (0 to 40°C)
	Ambient nonoperating	–40 to 158°F (–40 to 70°C)
Relative humidity	Operating	5 to 90 percent, non-condensing
	Nonoperating	5 to 90 percent, non-condensing
Altitude	Operating	0 to 10,000 ft (0 to 3,048 meters)
	Nonoperating	–1000 ft. to 30,000 ft (–305 to 9144 meters)

Switch Dimensions

The dimension of the N9348Y12C-SE1 switch are

Switch	Width	Depth	Height
Cisco N9348Y12C-SE1	17.3 inches (439.4mm)	18.09 inches (459.59mm)	1.72 inches (43.7mm)

Switch and Module Weights and Quantities

This section lists the switch and its components, their weights, and the quantity of each module that is shipped with the switch, by default.

Component	Weight per module	Quantity
Cisco N9348Y12C-SE1		1
Fan modules		
Port-side intake (burgundy) NXA-SFAN-35CFM-PI	0.28 lb (0.13 kg)	4
Port-side exhaust (blue) (NXA-SFAN-35CFM-PE)	0.28 lb (0.13 kg)	
Power supply modules		
650W AC port-side intake (burgundy) (NXA-PAC-650W-PI)	2.42 lb (1.1 kg)	2
650W AC port-side exhaust (blue) (NXA-PAC-650W-PE)	2.42 lb (1.1 kg)	
930W DC port-side intake (burgundy) NXA-PDC-930W-PI	2.42 lb (1.1 kg)	
930W DC port-side exhaust (blue) NXA-PDC-930W-PE	2.42 lb (1.1 kg)	
1200W HVAC dual-direction (white) (N9K-PUV-1200W)	2.42 lb (1.1 kg)	

Transceiver and Cable Specifications

To see the transceiver specifications and installation information, see

<https://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html>.

Switch Power Input Requirements

This table lists the typical amount of power that the switch consumes. It also lists the maximum amount of power that you must provision for the switch and power supply for peak conditions.

Switch	Typical Power Consumption (AC or DC)	Maximum Power Consumption (AC or DC)	Heat Dissipation Requirement
Cisco N9348Y12C-SE1	275 W	490 W	1,774 BTU/hr



Note Some power supplies have capabilities that are greater than the maximum power requirements for a switch. To determine the power consumption characteristics for the switch, use the typical and maximum requirements that are listed here.

Power Specifications

By default, the N9348Y12C-SE1 switch is powered with two 650W power supply units (PSUs) in 1+1 mode.

Power specifications include the specifications for each type of power supply module.

350W AC Power Supply Specifications

These specifications apply to the following power supplies:

- NXA-PAC-350W-PE
- NXA-PAC-350W-PI

Characteristic	Specification
AC input voltage	100 to 120 VAC, 200 to 240 VAC
AC input frequency	Nominal range: 50 to 60 Hz
Maximum AC input current	4 A at 100 to 120 VAC 2A at 200 to 240 VAC
Maximum output power per power supply	350 W
Maximum inrush current	33 A (sub-cycle duration)
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum certified)
Form factor	RSP1

350W PHV Power Supply Specifications

These specifications apply to the following power supplies:

- NXA-PHV-350W-PE
- NXA-PHV-350W-PI

Characteristic	Specification
Input voltage	240 to 380 VDC 100 to 277 VAC
Input frequency	Nominal range: 50 to 60 Hz

Characteristic	Specification
Maximum output power per power supply	350 W
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum certified)
Form factor	RSP1

440W DC Power Supply Specifications

These specifications apply to

- NXA-PDC-440W-PE
- NXA-PDC-440W-PI

Characteristic	Specification
Maximum output power	440 W
Input current	16 -8 A
DC input voltage	Nominal Range: -48 to -60 VDC

Power Cable Specifications

These sections show the power cables that you can order and use with this switch.

DC Power Cable Specifications

This section lists the details and illustration of NXA-PDC-440W-PE/PI.

Part ID Number	Description	Photo
NXA-PDC-440W-PE/PI	The 440W DC power supply (NXA-PDC-440W-PE/PI) is shipped with wiring instructions along with these parts: LUG,FAST, UNIN, #8AWG, RED; LUG, FORK, INSL,16-14G, # 6, NY,BLUwNARROW TONGUE; LUG, RING, 16-14AWG, #6	

AC Power Cable Specifications

This section lists the power cables used with the AC power supply modules.

Power type	Power cord part number	Cord set description
	CAB-C13-C14-2M	Power cord jumper, C13 to C14 connectors, 6.6 feet (2.0 m)

Power type	Power cord part number	Cord set description
	CAB-C13-C14-AC	Power cord jumper, C13 to C14 (recessed receptacle), 10 A, 9.8 feet (3 m)
	CAB-C13-CBN	Cabinet jumper power cord, 250V AC, 10 A, C14-C13 connectors, 2.3 feet (0.7 m)
Argentina	CAB-250V-10A-AR	250 V , 10 A, 8.2 feet (2.5 m)
Australia	CAB-9K10A-AU	250 V AC, 10 A, 3112 plug, 8.2 feet (2.5 m)
Brazil	CAB-250V-10A-BR	250 V , 10 A, 6.9 feet (2.1 m)
European Union	CAB-9K10A-EU	250 V AC, 10 A, CEE 7/7 plug, 8.2 feet (2.5 m)
India	CAB-IND-10A	10 A, 8.2 feet (2.5 m)
Israel	CAB-250V-10A-IS	250 V , 10 A, 8.2 feet (2.5 m)
Italy	CAB-9K10A-IT	250 V AC, 10 A, CEI 23-16/VII plug, 8.2 feet (2.5 m)
North America	CAB-9K12A-NA	125 V AC, 13 A, NEMA 5-15 plug, 8.2 feet (2.5 m)
North America	CAB-AC-L620-C13	NEMA L6-20-C13, 6.6 feet (2.0 m)
North America	CAB-N5K6A-NA	200/240V , 6A, 8.2 feet (2.5 m)
Peoples Republic of China	CAB-250V-10A-CN	250 V , 10 A, 8.2 feet (2.5 m)
South Africa	CAB-250V-10A-ID	250 V , 10 A, 8.2 feet (2.5 m)
Switzerland	CAB-9K10A-SW	250 V AC, 10 A, MP232 plug, 8.2 feet (2.5 m)
All except Argentina, Brazil, and Japan	NO-POWER-CORD	No power cord included with switch

Regulatory Standards Compliance Specifications

This table lists the regulatory standards compliance for the switch.

Table 4: Regulatory standards compliance: safety and EMC

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	• CAN/CSA-C22.2 No. 60950-1 Second Edition • CAN/CSA-C22.2 No. 62368-1-19 Third Edition • ANSI/UL 60950-1 Second edition • IEC 62368-1 • EN 62368-1 • AS/NZS 62368-1 • GB4943 • UL 62368-1
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 and EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The product is RoH-6 compliant with exceptions for leaded-ball grid-array (BGA) balls and lead press-fit connectors.



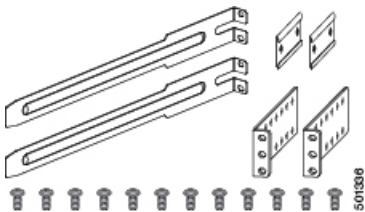
APPENDIX C

Additional Kits

- Rack Mount Kit N3K-C3064-ACC-KIT, on page 57
- Rack Mount Kit NXX-ACC-RMK-1RU, on page 57
- Rack Mount Kit for a Two-Post Rack, on page 58
- Airflow Sleeve, on page 58

Rack Mount Kit N3K-C3064-ACC-KIT

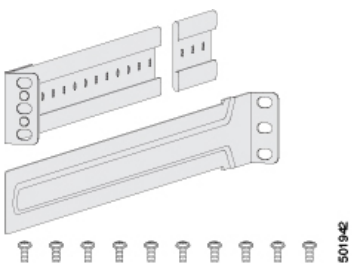
The following table lists and illustrates the contents for the 1-RU rack-mount kit (N3K-C3064-ACC-KIT).

Illustration	Description	Quantity
	Rack-mount kit • Front-mount angled bracket (2) • Rear-mount slider bracket (2) • Slider rails (2) • M4 x 7 mm mounting screws (16)	1
	Ground lug kit • Two-hole lug (1) • M4 x 8-mm Phillips pan-head screws (2)	1
Not applicable	EAC Compliance document	1
Not applicable	Hazardous substances list for customers in China	1

Rack Mount Kit NXX-ACC-RMK-1RU

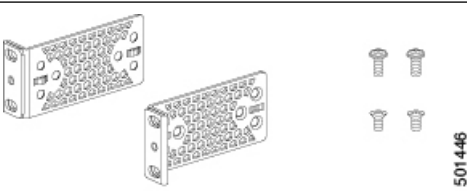
This table lists and illustrates the contents for the 1-RU rack-mount kit, NXX-ACC-RMK-1RU.

Table 5: Rack mount kit contents

Illustration	Description	Quantity
	Rack-mount kit • Front brackets (2) • Rear brackets (2) • Slider rails (2) • M4 Phillips pan-head screws (10)	1
	Ground lug kit • Two-hole lug (1) • M4 x 8-mm Phillips pan-head screws (2)	1
Not applicable	EAC compliance document	1
Not applicable	Hazardous substances list for customers in China	1

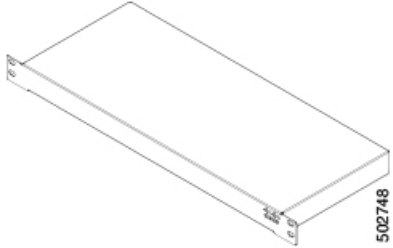
Rack Mount Kit for a Two-Post Rack

The following table lists and illustrates the contents for the two-post rack-mount kit (NXK-ACC-KIT-2P).

Illustration	Description	Quantity
	Rack-mount kit 1 • Bracket (2) • M4 Phillips pan-head screws (4) • Number-8 Phillips flat-head screws (8)	1

Airflow Sleeve

The following table lists and illustrates the airflow sleeve (NXA-AIRFLOW-SLV3).

Illustration	Description	Quantity
	Airflow sleeve	1

