



Powering on the Router

This chapter describes how to connect the power modules in the chassis and to power on the router.

- [Power Supply Overview, on page 1](#)
- [Power Connection Guidelines for AC-Powered Systems, on page 2](#)
- [Connect AC Power to the Chassis, on page 3](#)
- [Connect a DC Power Supply to the Chassis, on page 14](#)

Power Supply Overview

You can install up to four 3.2KW AC or 3.2KW DC power supplies in the chassis. Ensure that all power connection wiring conforms that to the rules and regulations in the National Electrical Code (NEC) and in local codes.



Note The Cisco 8608 chassis doesn't support a mix of AC and DC Power Supply Units (PSUs).

AC Power Module

- The AC power modules are single feed with 3.2KW capacity at 220V. They also support operation at 110V with half the capacity of 1570W.
- AC power modules are rated at 3.2KW maximum at 230V AC high line input, and 1570W maximum at 115V AC low line input.
- AC nominal range: 100—120V AC and 200—240V AC
- AC full range: 85—132 V AC and 180—264V AC; with extended range to 300V AC

DC Power Module

- The DC power modules are dual feed with 3.2KW capacity at any specified input voltage. DC power modules with single feed at any specified input voltage provide up to 1.6KW maximum capacity.
- DC nominal range: -48 to -60VDC
- DC full range: -40 to -75VDC

Power Connection Guidelines for AC-Powered Systems

When connecting AC-input Power Supply Units (PSUs) to the site power source, observe the guidelines described here.



Warning **Statement 1028**—More Than One Power Supply

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



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- Ensure that the AC-input power supply module has a detachable power cord.
 - Each chassis power supply should have a separate, dedicated branch circuit.
 - North America
 - PSU3.2KW-ACPI only—Power supply modules require a 20 A circuit.
 - International—Circuits should be sized according to local and national codes.
 - If you are using a 208 or 240 VAC power source in North America, note that such lines are considered hot and the circuit must be protected by a two-pole circuit breaker.



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:

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- 20 A circuit breaker for an AC-input power supply module.
 - 50 A DC-rated circuit breaker for each input of a DC-input power supply module, for safety purposes - irrespective of whether the inputs are power from a single or separate DC sources.



Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. **Statement 1045**



Warning Statement 1022—Disconnect Device

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

- The source AC outlet must be within 9.84 to 14 feet (3.0 to 4.293 meters) of the system - depending on the length of the power cord, and should be easily accessible.
- The AC power receptacles used to plug in the chassis must be the grounding type. The grounding conductors that connect to the receptacles should connect to protective earth ground at the service equipment level.

Connect AC Power to the Chassis



Warning Statement 1017—Restricted Area

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



Warning Statement 1005—Circuit Breaker

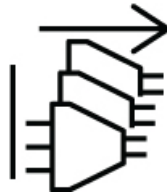
This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

AC: 20A, DC: 50A



Warning Statement 1028—More Than One Power Supply

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 Statement 1003—DC Power Disconnection

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



Warning **Statement 1046**—Installing or Replacing the Unit

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 **Statement 1022**—Disconnect Device

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



Warning **Statement 1029**—Blank Faceplates and Cover Panels

Blank faceplates and cover panels serve three important functions: they reduce the risk of electric shock and fire, they contain electromagnetic interference (EMI) that might disrupt other equipment, and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.



Caution The chassis relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices comply with local and national electrical codes.



Note We recommend that you occupy all power supply slots of the router with power supplies. In case a power module fails, it is recommended to retain the failed power module in its slot until it is replaced with a new power module. This recommendation ensures that the system airflow is not impacted adversely, which may then result in the overheating of the router and its components.

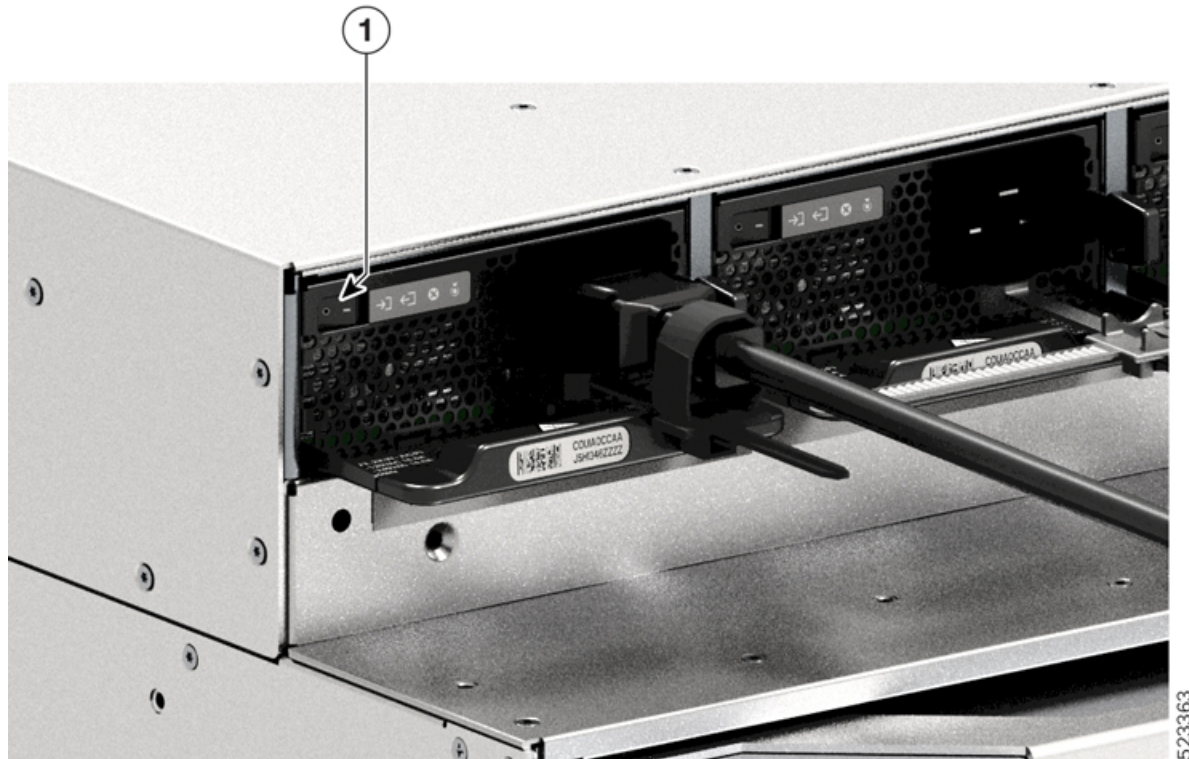


Note A dual pole breaker is needed for installation. For determining the recommended breaker size, please adhere to local and national rules and regulations. The breaker size is based on the specifications of the product for the current drawn and the specified voltage level.

Procedure

- Step 1** Verify that the AC cable is installed in the correct AC source and outlet type.
- Step 2** Set the AC-input power supply switch to the OFF (0) position.

Figure 1: Power Switch in Off Position

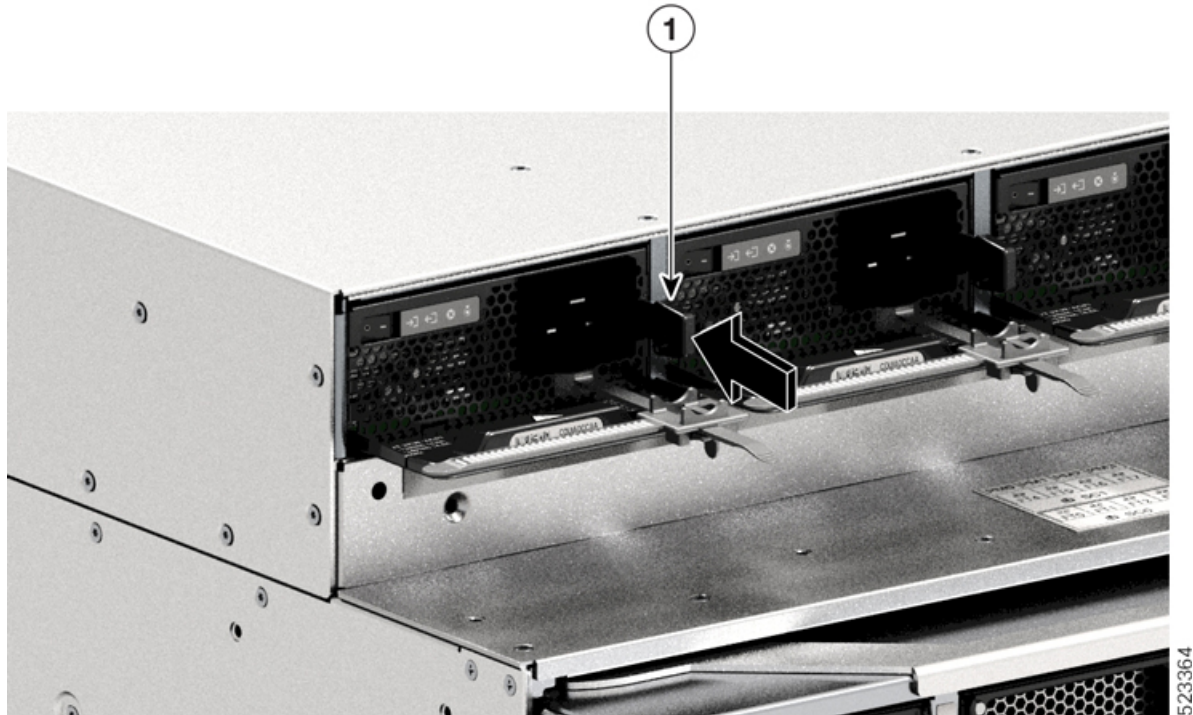


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1	Power supply in the OFF (0) position
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- Step 3** Grasp the power supply handle with one hand and place your other hand underneath to support the bottom of the PSU. Slide the PSU all the way into the power supply bay. Ensure that the PSU is fully seated in the bay. When correctly installed, the latch on the PSU locks-in the module, to avoid accidental removal of the module.

Figure 2: Slide the PSU into the Power Supply Bay

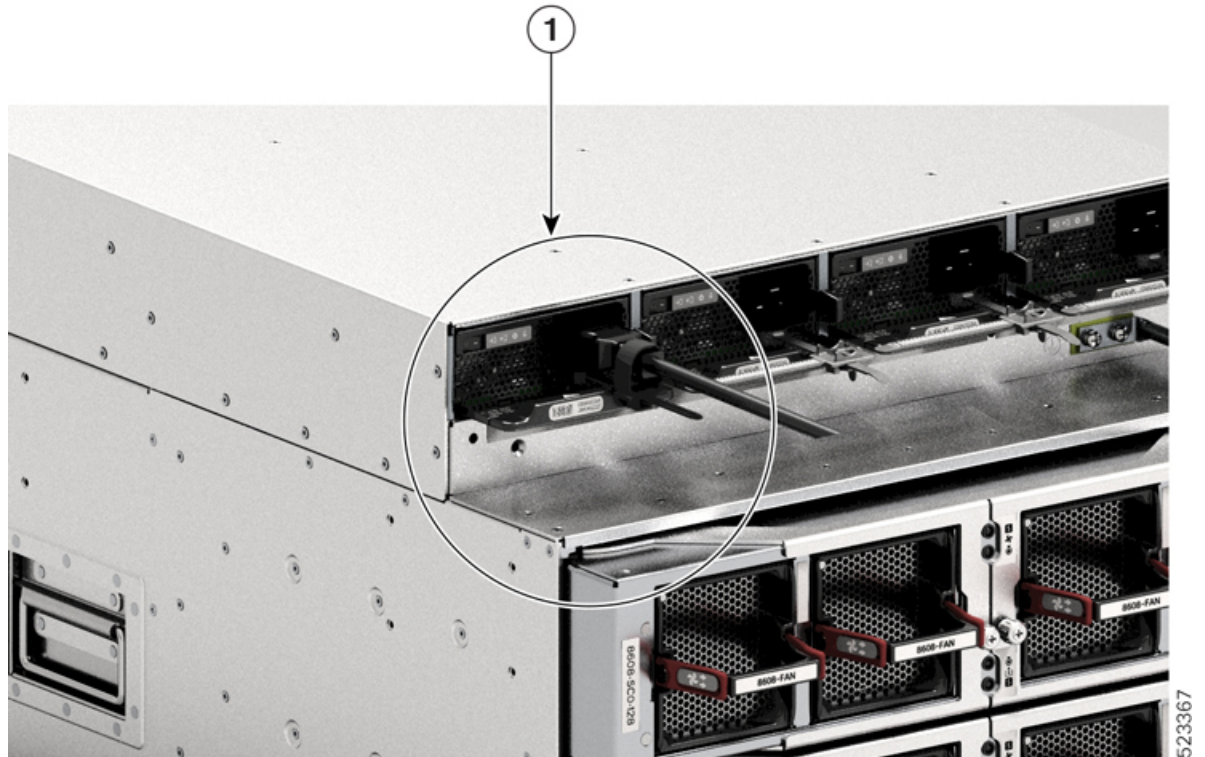


1	Power supply latch, which clicks into place
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Step 4 Verify that all site power and grounding requirements have been met.

Step 5 Verify that you have the correct AC power cord for your location and power supply rating and only then plug the power cord connector into the power supply AC-in receptacle.

Figure 3: Plug Power Cord Connector into AC-in Receptacle



1	Power cord, plugged into the AC-in receptacle
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Step 6 Strap in the power cord retainer, to hold it in place and avoid accidental removal. For more information, see [Power Cord Retainer Mechanism](#)

Step 7 Set the power switch to the on (I) position

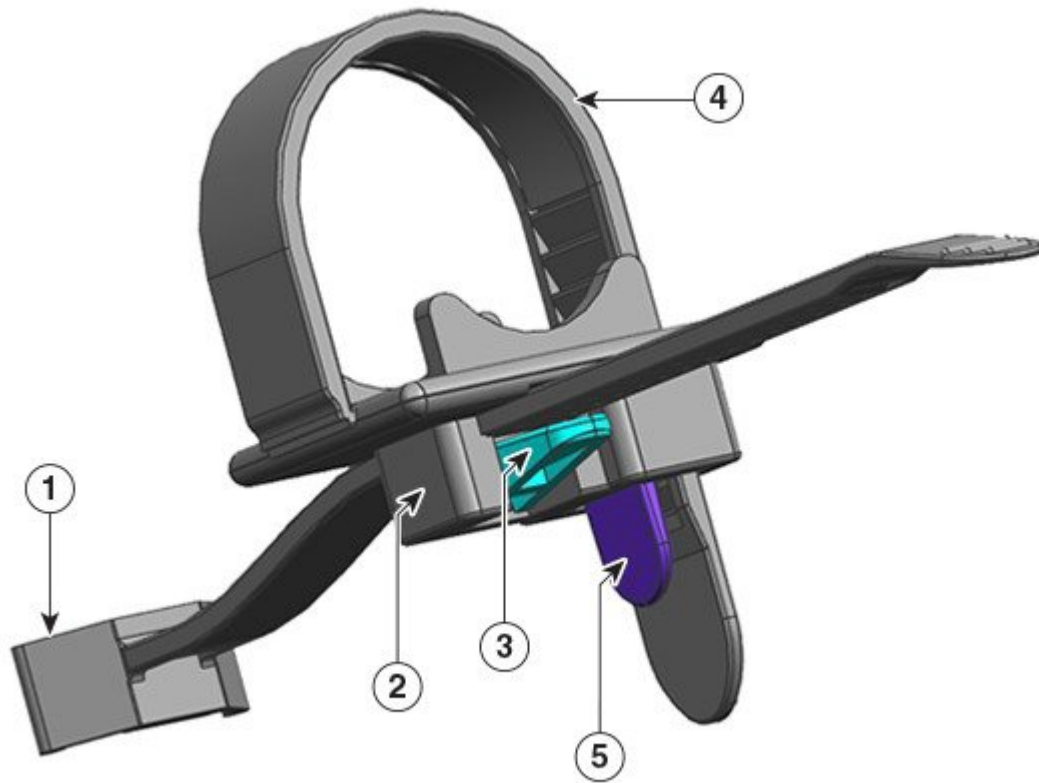
Power Cord Retainer Mechanism

This section shows how to correctly operate the power cord retainer, to tighten or loosen it while installing or removing the power supply unit.



Note Some of the illustrations do not include the power supply module, for the sake of clarity. The retainer is otherwise permanently fixed to the power supply module.

Figure 4: Parts of the Power Cord Retainer



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1	The end that is fixed to the power supply unit	4	Flexible retainer strip
2	Clamp which can move towards the power supply or away from it	5	Retainer strip latch
3	Clamp latch		

Installation and Removal Sequence

Installation—After you have inserted the power supply unit into the bay, first position the clamp closest to the power supply, near the plug round cylinder stress relief and then insert the flexible retainer strip into the clamp hole and tighten. The clamp cannot be moved after the flexible retainer strip is inserted into the clamp hole.

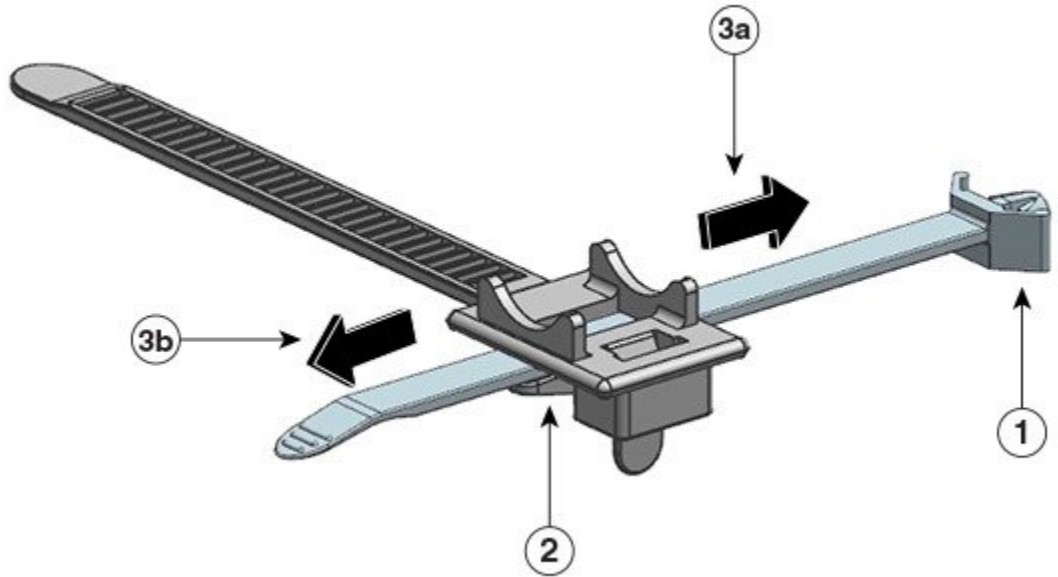
Removal—After you have turned off the power supply unit's rocker switch, first remove the flexible retainer strip from the clamp hole and then adjust the position of the clamp to remove the power cord.

Positioning the Clamp

In figure, [Figure 5: Positioning the Clamp](#), the clamp can always move freely in direction 3a. To move the clamp in direction 3b, use a flathead screwdriver or similar device and push the clamp latch down. The figure,

Figure 6: **Clamp Latch - Detail**, provides a clearer view of the clamp latch and the direction in which you have to push the latch to move it in direction 3b.

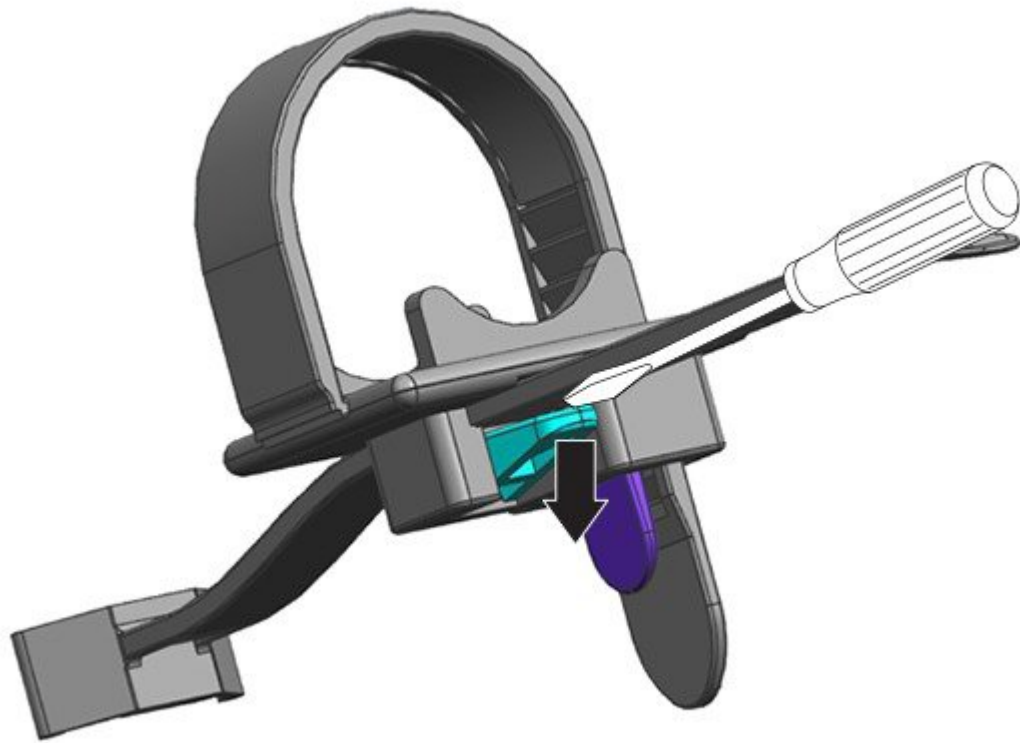
Figure 5: Positioning the Clamp



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1	The end that is fixed to the power supply unit	3a and 3b	Directions in which the clamp can be moved, towards the power supply and away from it.
2	Clamp Latch		

Figure 6: Clamp Latch - Detail



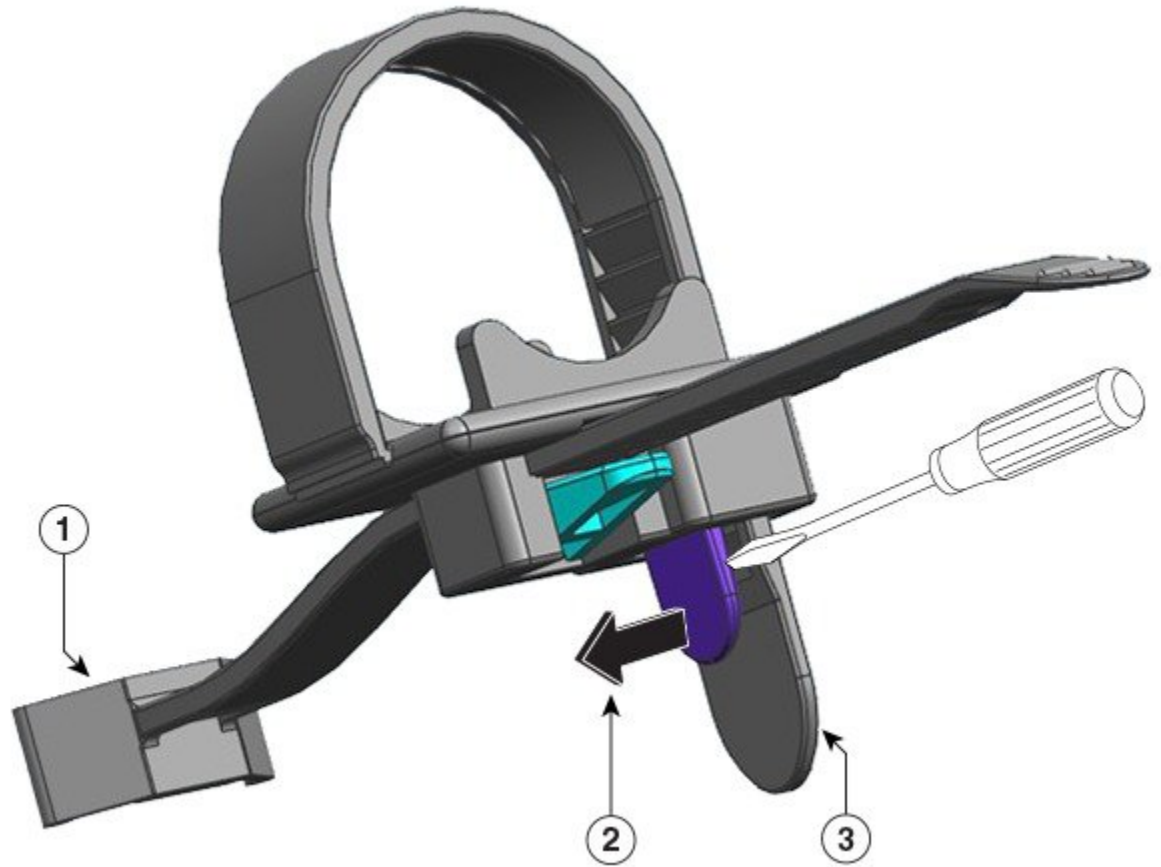
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Inserting and Tightening the Retainer Strip

The flexible retainer strip inserts into the clamp hole and should be tightened around the power cord.

To loosen or remove the flexible retainer strip, position a flathead screwdriver or similar device between the flexible retainer strip and the retainer strip latch and push the latch away from the flexible retainer strip.

Figure 7: Flexible Retainer Strip



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1	The end that is fixed to the power supply unit.	3	Flexible retainer strip
2	Direction in which to push the retainer strip latch, to loosen or remove the strip from the power cord (away from the retainer strip that is behind it)		

3.2KW Power Supply Unit AC Power Cords

The following table lists the specifications for the AC power cords that are available for the 3.2KW AC-input power supply. The table also includes references to power cord illustrations.



Note All 3.2KW power supply power cord:

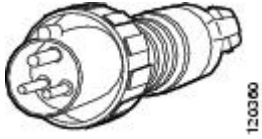
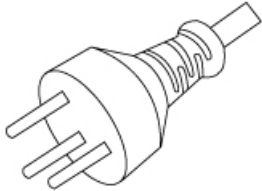





- Lengths range from 9.84 – 14 feet (3.0 – 4.293 meters); with most cord lengths between 13 and 14 feet (4.013 and 4.293 meters)
- Have an IEC60320/C19 appliance connector at one end.


Figure 8: IEC60320/C19 Appliance Connector



Table 1: 3200 W Power Supply AC Power Cords

Locale	Part Number	Cordset Rating	AC Source Plug Type
Argentina	CAB-I309-C19-INTL	20 A, 250 VAC	<p>Figure 9: CAB-I309-C19-INTL= (Argentina)</p>
Australia	CAB-AC-16A-AUS	16 A, 250 VAC	<p>Figure 10: CAB-AC-16A-AUS= (Australia)</p>
China	CAB-9K16A-CH	16 A, 250 VAC	<p>Figure 11: CAB-9K16A-CH= (China)</p>
Europe	CAB-CEE77-C19-EU	16 A, 250 VAC	<p>Figure 12: CAB-CEE77-C19-EU= and CAB-I309-C19-INTL= (Europe)</p>
	CAB-I309-C19-INTL	20 A, 250 VAC	
India	CAB-SABS-C19-IND	16 A, 250 VAC	<p>Figure 13: CAB-SABS-C19-IND= (India)</p>

Locale	Part Number	Cordset Rating	AC Source Plug Type
International	CAB-I309-C19-INTL	20 A, 250 VAC	<p><i>Figure 14: CAB-I309-C19-INTL= (International)</i></p>  <p>1200360</p>
Israel	CAB-S132-C19-ISRL	16 A, 250 VAC	<p><i>Figure 15: CAB-S132-C19-ISRL= (Israel)</i></p>  <p>3515309</p>
Italy	CAB-C2316-C19-IT	16 A, 250 VAC	<p><i>Figure 16: CAB-C2316-C19-IT= (Italy)</i></p>  <p>1200398</p>
Japan, North America (Nonlocking Plug) 200 to 240 VAC Operation	CAB-US620P-C19-US	20 A, 250 VAC	<p><i>Figure 17: CAB-US620P-C19-US= (Japan, North America - Nonlocking)</i></p>  <p>1200393</p>
Japan, North America (Locking Plug) 200 to 240 VAC Operation	CAB-L620P-C19-US	20 A, 250 VAC	<p><i>Figure 18: CAB-L620P-C19-US= (Japan, North America - Locking)</i></p>  <p>1200361</p>
North America	CAB-US520-C19-US	20 A, 125 VAC	<p><i>Figure 19: CAB-US520-C19-US= (North America)</i></p>  <p>1200362</p>
South Africa	CAB-I309-C19-INTL	20 A, 250 VAC	<p><i>Figure 20: CAB-I309-C19-INTL= (South Africa)</i></p>  <p>1200360</p>

Locale	Part Number	Cordset Rating	AC Source Plug Type
UPS 220V	CAB-C19-CBN	20 A, 250 VAC	<p><i>Figure 21: 130923</i></p> 

Connect a DC Power Supply to the Chassis

When installing a DC-input Power Supply Unit (PSU), you will need access to the terminal block of the PSU in order to connect the DC-input wires. If the front panel of the chassis has limited access because of other interfering cables, consider connecting the DC-input wires to the terminal block, before you install the PSU in the chassis. If you do have clear access to the terminal block, you can install the PSU in the chassis first and then connect the DC-input wires.

The procedure to install the module in the chassis and the procedure to connect the DC-input wires have been described in [Connecting the DC-Input Wires, on page 17](#). You can complete either task first and then move on to the next, and finally power up the PSU.

Install a DC Power Supply Unit in the Chassis



Note The power button has two modes of operation, which are described below. Press the power button for 10 seconds to toggle between modes; the LOCATE LED blinks for three seconds when you do.

- **Auto-on:** When in this mode, the power supply module automatically starts or restarts on application or restoration of DC input power. This is the default mode.

For NEBS compliance, the power button must be in the auto-on mode. When power is restored after a power failure, the power supply module recovers automatically.

- **Protected:** When in this mode, if the DC power source output voltage is zero, or drops out for more than three seconds, you must press the power button for two seconds, to restore operation.

To install a DC-input Power Supply Unit (PSU) in the chassis, follow the steps described here.

Before you begin



Warning **Statement 1073**—No User-Serviceable Parts

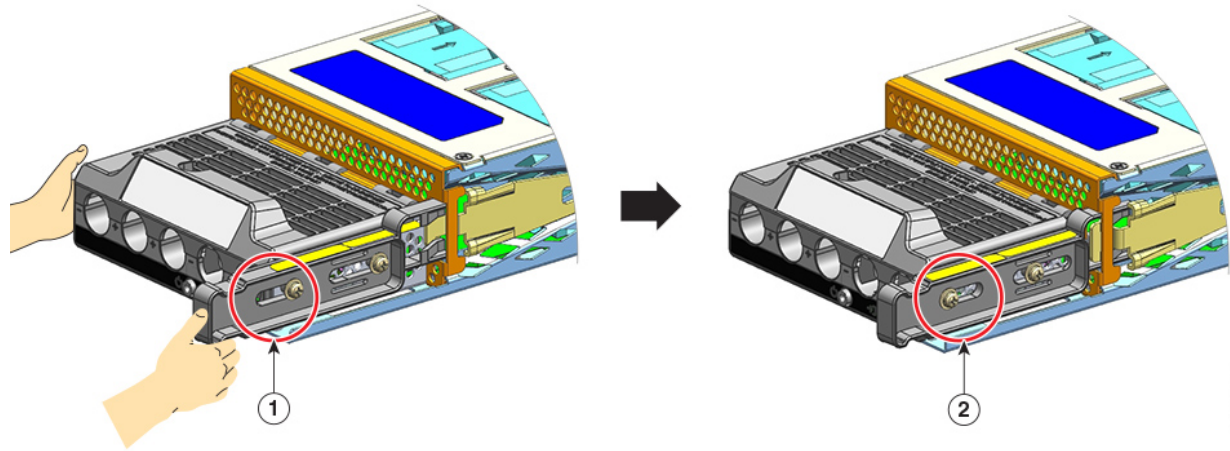
There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Procedure

Step 1 Remove the new or replacement unit from its packaging.

Step 2 Grasp the module with one hand. With your other hand, push in the latch on the module.

Figure 22: Push the Latch on the Module



1	Position of the nut on the side of the release latch <i>before</i> the latch is pushed in	2	Position of the nut on the side of the release latch <i>after</i> the latch is pushed in.
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Step 3 Grasp the terminal block with one hand. Place your other hand underneath as you slide the PSU into the bay. You will hear an audible *click* sound, which indicates that the module is locked into place, and connected with the backplane. Only the terminal block housing is not flush with the chassis.

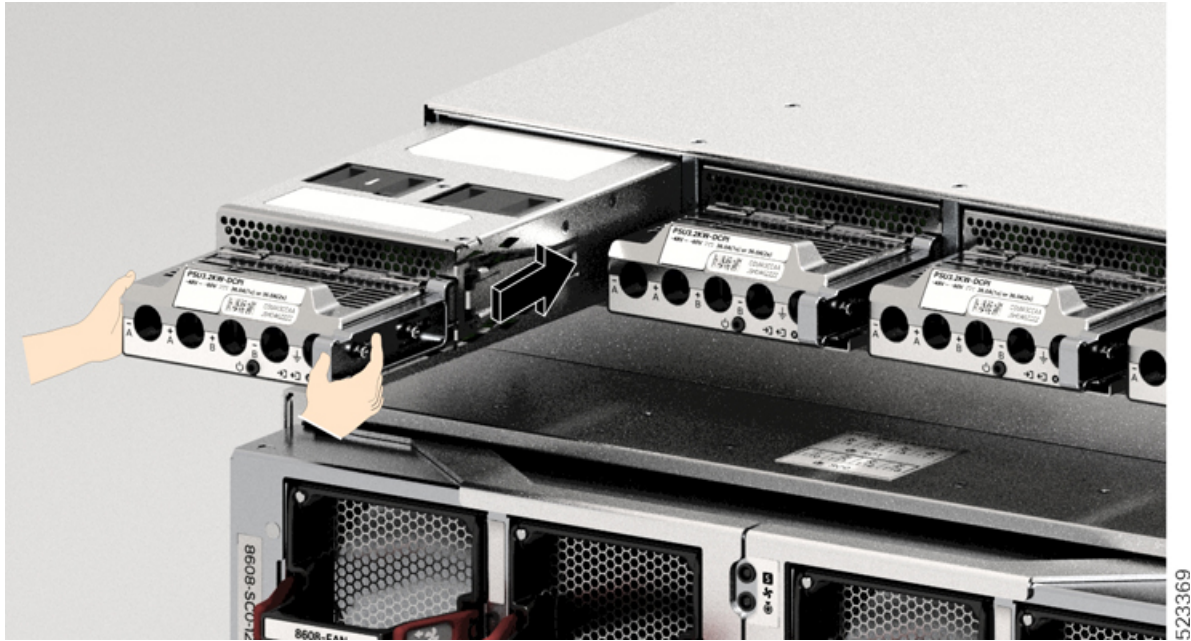
If you do not push the release latch in before you slide the module into the bay, you will not hear the click sound, but this is an acceptable way of installing the module.

If the module is properly locked in place, you should not be able to remove the module without releasing the latch.

The following figure shows how a PSU slides into the bay:

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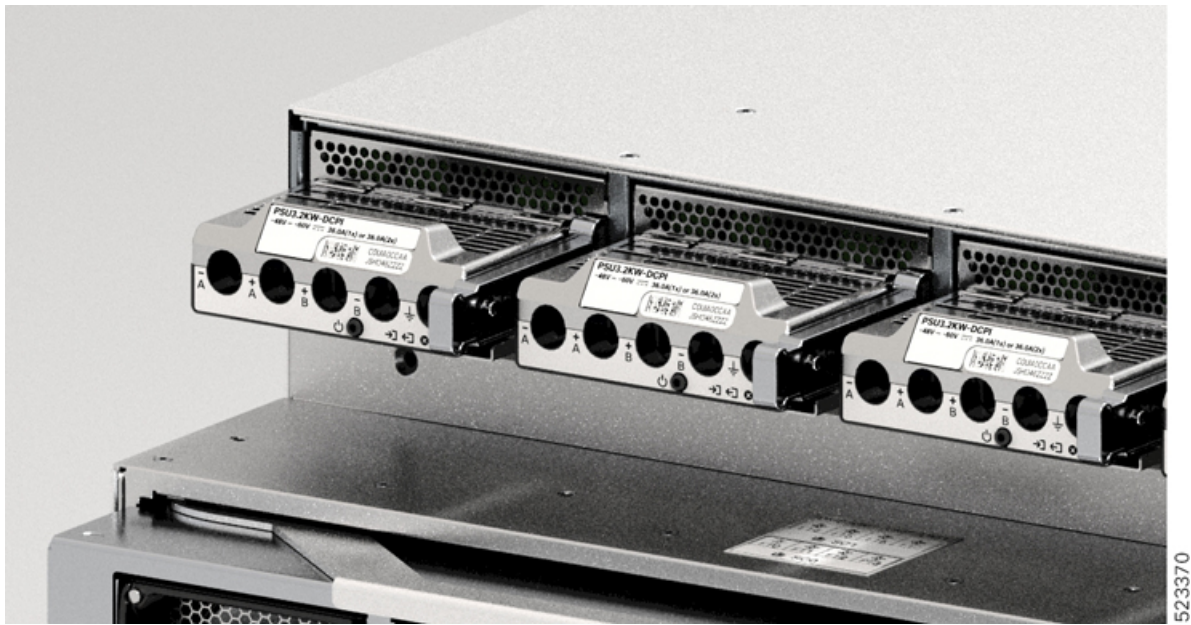
Figure 23: PSU Slides into the Bay



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The following figure shows a PSU that is fully installed in the bay:

Figure 24: PSU Installed in the Bay



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Connecting the DC-Input Wires

When removing a DC Power Supply Unit (PSU), you will need access to the terminal block of the module to disconnect the DC-input wires. If the front panel of the chassis has limited access because of other interfering cables, consider removing the module from the chassis before disconnecting the DC-input wires. If you do have clear access to the terminal block, you can disconnect the DC-input wires and then remove the module from the chassis. In either case (whether you have access to the front panel or not), you must begin by completing all the steps described in [Powering Down the DC-Input Power Supply](#). Proceed with the next task depending on your setup.

The procedures to disconnect DC-input wires and to remove the module from the chassis have been described in [Disconnect the DC-Input Wires](#) and [Remove a DC Power Supply Unit from the Chassis](#).

To connect to the DC-input power source, follow the steps described here.

Before you begin



Warning Statement 1073—No User-Serviceable Parts

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Procedure

Step 1 Locate the circuit breaker on the panel board that services the DC circuit, and switch the circuit breaker to the OFF position.

Step 2 Prepare the DC-input wires and the grounding wire. Crimp the lugs to the cable ends according to the lug manufacturer's direction and your local electrical codes for installation.

Use a heat-shrink sleeve to ensure that there is no exposed wiring extending from the terminal block, when installed.

If you are using cables of different colors for your DC-input wires, we recommend one color for all the positive circuits, a second color for all the negative circuits, and a third color, which is normally solid green or green with yellow stripes, for the safety ground connection.

Step 3 Using a number one Phillips screwdriver, loosen the captive installation screw on the terminal block cover.

Step 4 Using a nut driver, loosen and remove the two nuts in the terminal slot meant for grounding, and set them aside.

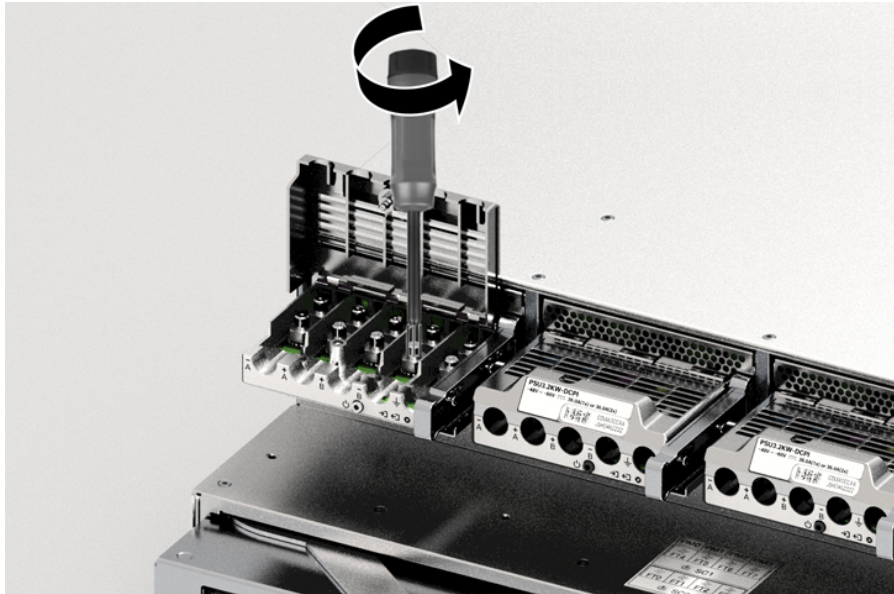
The nut driver you are using must have at least a three-inch shaft, to clear the height of the terminal block cover and enable you to loosen or tighten the nuts in the terminal slots.

Warning Statement 1046—Installing or Replacing the Unit

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.

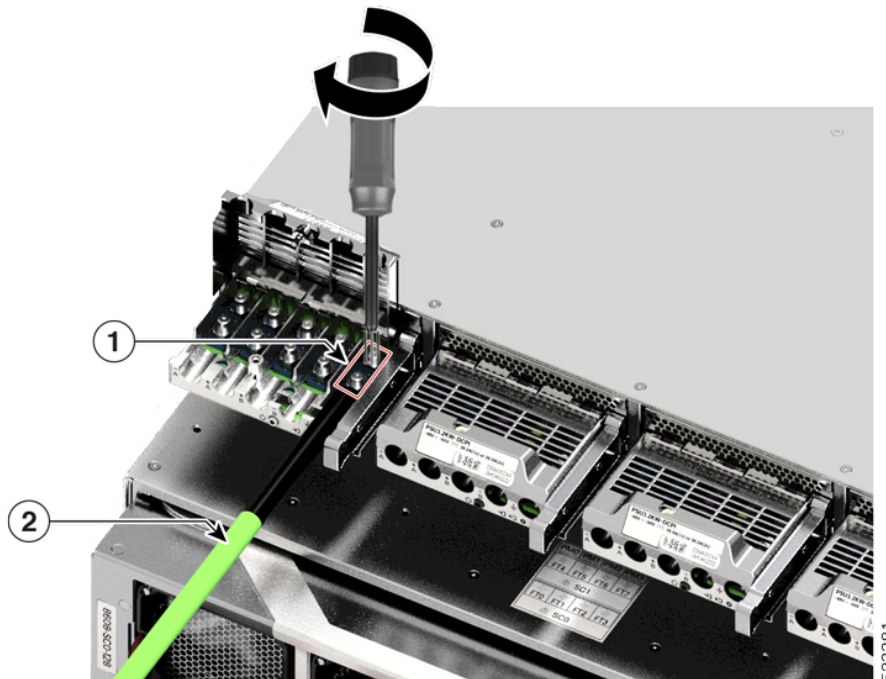
Figure 25: Remove the Nuts for Grounding



Step 5 Attach the lug to the two posts, secure with the two nuts, and tighten with the torque driver. The fastening torque is between 2.0 and 2.8 Nm. Do not overtorque.

Note Always use a torque driver when you have to tighten nuts; it prevents you from overtightening them.

Figure 26: Tighten the Nuts



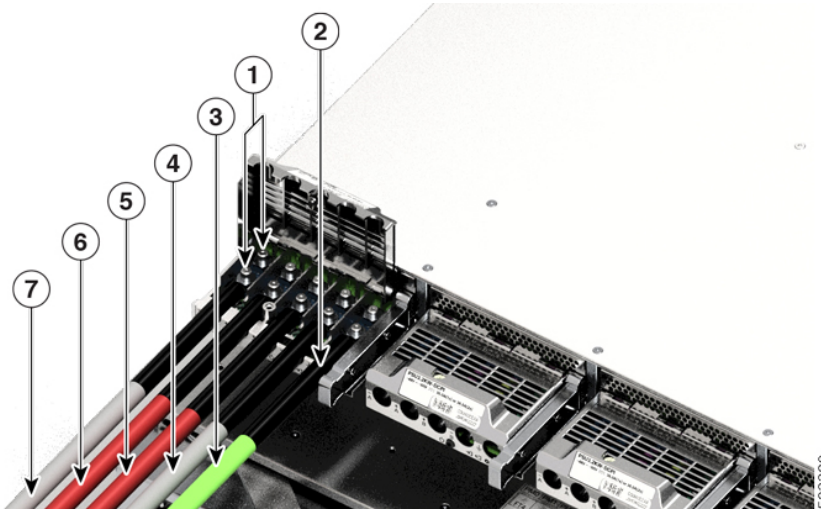
1	Lug secured with the two nuts	2	Grounding wire with heat-shrink sleeve
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Step 6 Attach the four DC-input power source cables similarly.

When facing the terminal block, the circuits are in the following order from left to right: negative (- A), positive (+A), positive (+ B), and negative (-B).

-A and +A form one DC input, and + B and -B form another. Each DC input can be powered either from separate sources, or a suitable single source.

Figure 27: Attach DC-input Power Source Cables



1	Lug secured with two nuts	5	DC-input wire for positive circuit (+ B)
2	Heat-shrink sleeve on all the wires	6	DC-input wire for positive circuit (+A)
3	Grounding wire	7	DC-input wire for negative circuit (- A)
4	DC-input wire for negative circuit (-B)	-	-

Step 7 Close the terminal block cover and finger-tighten the captive installation screw (approximately 0.25 Nm).

Figure 28: Close Terminal Block Cover



Power Up a DC Power Supply Unit

After you have installed the Power Supply Unit (PSU) in the chassis and connected the DC-input wires, follow the steps described here to power up the module and verify that the module is installed correctly.

Before you begin



Warning Statement 1073—No User-Serviceable Parts

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Procedure

- Step 1** For the powered down circuits connected to the PSUs, turn on the power at the circuit breaker. The FAIL LED is illuminated for two to three seconds after DC input is applied through a circuit breaker.
- Step 2** Check that the INPUT and OUTPUT LEDs on the PSU are green.
- Note** DC-input PSUs are shipped with the power button in the default auto-on mode, which means that the unit automatically starts on application of DC-input power. When you install a new or replacement unit straight out of the box, you do not have to press the power button.
- Step 3** Verify the polarity by measuring the voltage between the DC cable leads. When measuring, check that the positive (+) lead and the negative (–) lead match the + and – labels on the DC-input PSU's terminal block.

If the DC inputs are powered from separate sources, also check that you have wired the cables straight across to their respective A source and B source, and respective negative and positive terminals. Crossed positive or negative cables constitute a severe safety hazard.
