

System Installation

This chapter describes the procedures for installing and connecting a VCO/4K system. Before installation, read the *Cisco VCO/4K Hardware Planning Guide*, along with the *Cisco VCO/4K Site Preparation Guide*.

Use the checklist in the *Cisco VCO/4K Site Preparation Guide* to verify that the site is prepared according to the guidelines.

It is easier to install the system as it is unpacked. Therefore, move the crated system to the installation location before you begin.

Safety Precautions

Observe the following safety precautions:

- Never install telecommunication circuits during a lightning storm.
- Never install telecommunication connections in wet locations unless the connector is specifically designed for wet locations.
- Never touch uninsulated telecommunication wires or terminals unless the circuit is disconnected at the network interface.
- Use caution when installing or modifying telecommunication circuits.
- Avoid contact with the backplane during the installation process to minimize the risk of injury from hazardous voltages.
- Two or more people are required to position the VCO/4K system. The Occupational Safety and Hazards Administration (OSHA) recommends a lifting weight limit of 40 pounds for women and 75 pounds for men. Observe local, regional, and national safety codes, as well as your company's safety rules and regulations. Refer to the *Cisco VCO/4K Site Preparation Guide* for the dimensions and weights of the systems.



Note To decrease the weight and make the system easier to handle, you can remove the power supply modules from the front of the VCO/4K (see Figure 1-1 and the *Open Me First* documentation packed with the system). This is also explained in the following procedures.

- Use an ESD wrist strap connected to the system for grounding to minimize the risk of damage when removing or replacing a system component.

- A licensed electrician must connect the feeds to the power entry module on the VCO/4K system according to the chart on the inside of the power protection cover.

Unpack and Inspect the System

The VCO/4K system is shipped as a complete unit. All the system components, including circuit cards, power subsystems, and storage subsystems, are mounted in the system. Cisco Systems loads the generic software on the system hard disk(s) and provides generic software copies on 3.5-inch floppy disks.

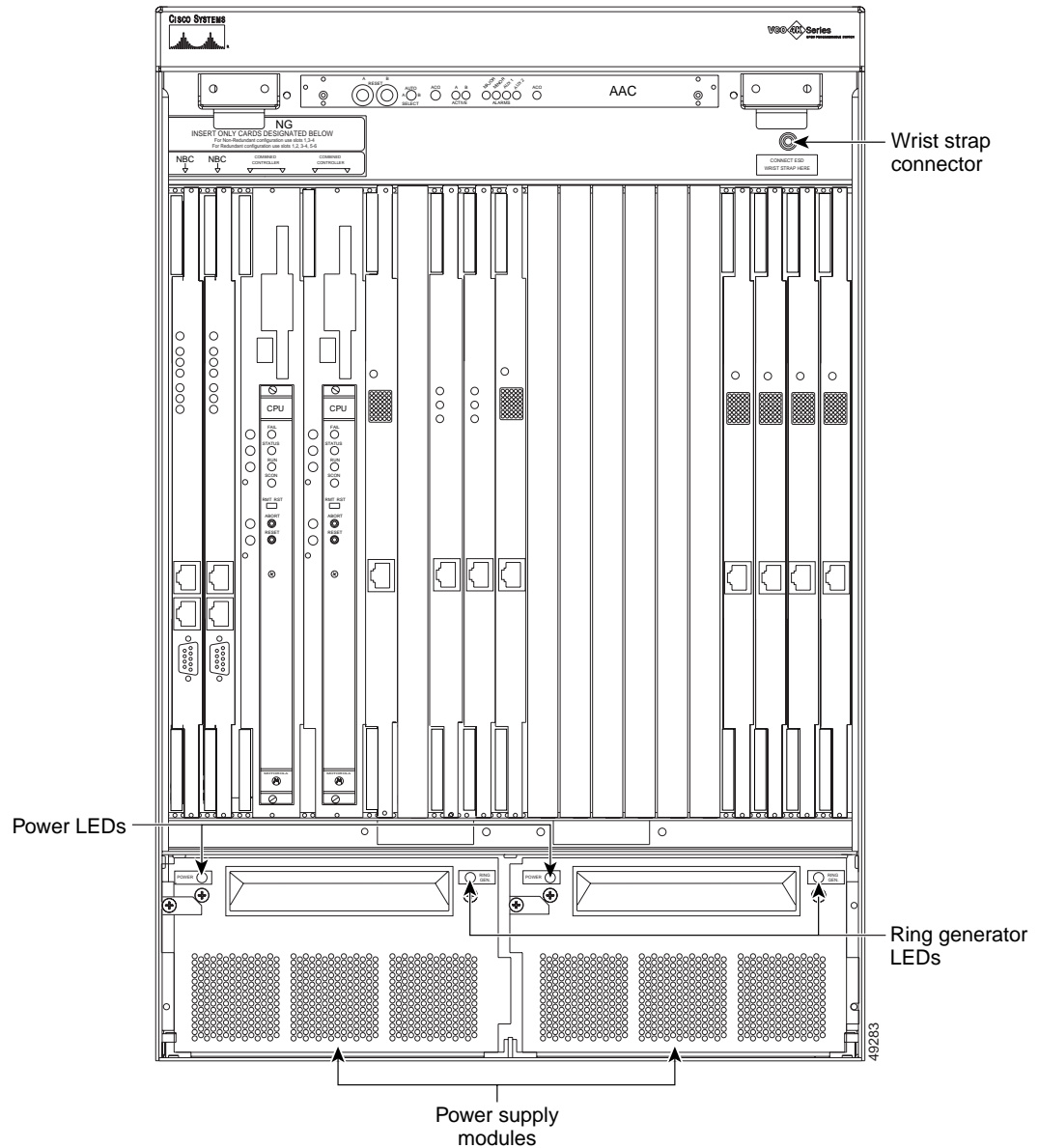
Peripheral equipment (master consoles, printers, modems) and interconnecting cables ordered through Cisco Systems are identified on the shipping and packing lists and shipped in OEM or separate containers.

Inspect all cartons at the time of delivery for signs of damage during transit. Notify the carrier and your insurance company if there is any shipping damage.

Refer to the *Open Me First* instructions that come with the system for complete instructions on inspecting the container and unpacking the system.

After unpacking the system, inspect all cables and cards. Look for signs of misalignment or abrasion that might have occurred during shipping, or when the system was removed from the shipping container. If the inspection reveals any signs of shipping damage, contact your shipper.

Figure 1-1 Front of VCO/4K



Installing the System

You can install the VCO/4K system in a cabinet or rack, or on a table or the floor. The following sections contain checklists for installing the system in both configurations.

Installing the System in a Cabinet or Rack

If you are installing the system in a cabinet or rack, set up the cabinet or rack and ensure that it is level and secured to the wall or floor before positioning the VCO/4K.

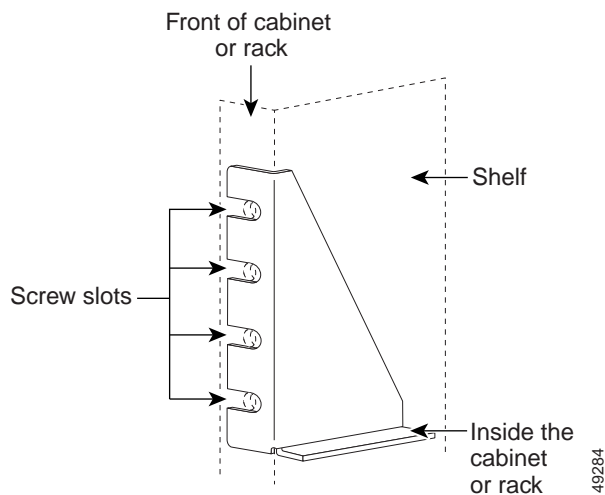
Secure the mounting shelf to the cabinet or rack and secure the mounting brace to the VCO/4K before lifting and placing it in the cabinet or rack.

Securing the Mounting Shelf

When installed in a cabinet or rack, the VCO/4K sits on the mounting shelf (included with the VCO/4K shipment). Secure the shelf to the cabinet or rack by tightening the screws through the screw slots into the cabinet.

Figure 1-2 shows the position of the mounting shelf on the cabinet or rack, and the screw slots.

Figure 1-2 Mounting Shelf



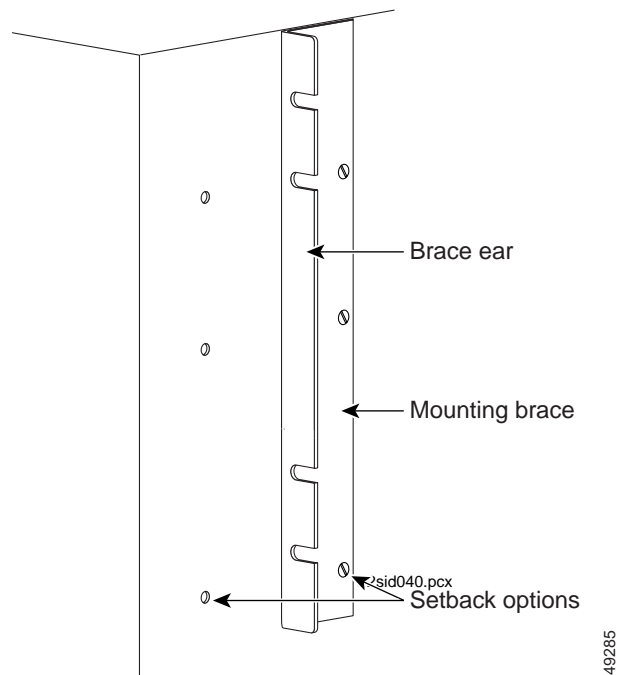
Securing the Mounting Brace

Before installing the VCO/4K in the cabinet or rack, secure the brace at the preferred setback option.

Figure 1-3 shows a mounting brace attached to a VCO/4K. The brace's ears are attached to the front of the cabinet or rack.

Note the setback options that are used for mounting in Figure 1-3. If the mounting brace is attached to the first option, the front of the VCO/4K is flush with the front of the cabinet or rack. If the brace is attached to the second setback option, the VCO/4K protrudes from the front of the cabinet or rack.

Figure 1-3 Mounting Brace



Removing the Power Supply Modules

To make lifting the VCO/4K easier, you can remove the power supply modules with the following steps:

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- Step 1** Remove the front door as follows:
- Unlock the door (if necessary).
 - Lift up on the two latch handles at the top.
 - Lift the door up and out.
- Step 2** Remove the two mounting screws on each power supply module with a Phillips-head screwdriver.
- Step 3** Pull the two power supply modules out to disconnect them from the power backplane.
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Mounting the System

After securing the mounting brace and shelf on the cabinet or rack, install the VCO/4K with the following steps:

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- Step 1** Position the system into the cabinet or rack on the mounting shelf.



Caution Use a minimum of two people to lift the system.

- Step 2** Secure the system to the cabinet or rack by tightening the screws in the screw slots (see Figure 1-2).



Note Ensure that the VCO/4K is resting securely on the mounting shelf before you tighten the screws.

- Step 3** Verify that the fuses are correct before installing the power supply modules.
- Each power supply module has one 25-amp fuse, either AC or DC power, and for either 120V at 50 Hz or 60 Hz, or 240V at 50 Hz or 60 Hz. The fuse is in the back of the power supply module.
- Step 4** Connect the power supply modules before continuing.
- Push the power supply modules in until they connect with the power backplane and are flush with the VCO/4K cabinet.
 - Secure the four mounting screws to the power supply modules with a Phillips-head screwdriver. Ensure that the black metal tabs are also secured.

Use the following checklist to ensure that each step is completed:

- ___ Set up or prepare the rack for the system.
- ___ Install the mounting shelf (included in the optional carton) in the rack.
- ___ Install the mounting brace (included in the optional carton) on the VCO/4K.
- ___ Remove the VCO/4K power supply modules from the bottom of the enclosure.
- ___ Position the VCO/4K in the cabinet or rack.
- ___ Bolt the VCO/4K to cabinet or rack.

Installing the System on the Floor or Table

If you are installing the system on the floor or a table, ensure that the system is level. Refer to the *Cisco VCO/4K Site Preparation Guide* for information on selecting and preparing an independent location for the VCO/4K.

A separate package contains rubber feet for installing the system on the floor or a table.

Installing the rubber feet on the system requires two people. Use the following steps:

- Step 1** One person tilts and holds the enclosure, leaving the other side raised from the floor and the bottom accessible to a second person. Do not tilt the system beyond a 45-degree angle without sufficient leverage or assistance from a third person.
- Step 2** The second person screws the rubber feet to the bottom corners of the raised side.
- Step 3** After the installer moves out from under the system, lower the enclosure.
- Step 4** Repeat Step 1 and Step 2 for the other side.
- Step 5** Verify that the fuses are correct before installing the power supply modules.
- Step 6** Connect the power supply modules before continuing.
 - Push the power supply modules in until they connect with the power backplane and are flush with the VCO/4K cabinet.

- b. Secure the four mounting screws to the power supply modules with a Phillips-head screwdriver. Ensure that the black metal tabs are also secured.

Use the following checklist to ensure that each step is completed:

1. ___ Ensure the installation location is level.
2. ___ Remove the VCO/4K power supply modules from the bottom of the enclosure.
3. ___ Install the rubber feet on the bottom of the VCO/4K.
4. ___ Position the VCO/4K.

Connecting Power to Power Entry Module



Caution

A licensed electrician must connect the feeds to the power entry module on the VCO/4K system according to the chart on the inside of the power protection cover.

Connecting the Power Source

The VCO/4K power subsystem receives electrical power from one three-conductor cable for single-line feed AC operation, two two-conductor cables for dual-line feed DC operation, or one one-conductor cable for single-line feed DC operation, all rated for 600 volts. Use a dedicated feed(s) [i.e., dedicated branch circuit(s)] and sufficiently sized conductors to route the power from a nearby power panel. Terminate the feed as a drop cable or in an appropriate outlet receptacle.

The power supply modules are identical; however, if a ring generator is present, it is installed in the left module. The type of input power (AC or DC) required by the VCO/4K is noted on the front of each power supply module. A label at the rear of your power entry module (PEM) will either specify your system's input power type (see Figure 1-4) or list both possibilities (see Figure 1-5). Always verify by looking at the front of each power supply module. Power travels from the power entry module to the power backplane, then to the power supply module which feeds the VCO/4K chassis.



Caution

Before connecting power to the VCO/4K, turn off the power switch on the power entry module (see Figure 1-4).

See Table 1-1 for AC and DC wiring connections.

Table 1-1 Input Wiring Connections for AC and DC VCO/4K Systems

Conductor	Terminal
Single Feed –48 VDC (nominal)	
Jumper 1	TB1 to TB4
Jumper 2	TB2 to TB5
Battery return (+)	TB4
Battery (–)	TB5
Ground (optional)	TB3

Table 1-1 *Input Wiring Connections for AC and DC VCO/4K Systems (continued)*

Conductor	Terminal
Dual Feed -48 VDC (nominal)	
Battery Return A (+)	TB1
Battery A (-)	TB2
Battery Return B (+)	TB4
Battery B (-)	TB5
Ground	TB3
Single Feed 120 VAC (nominal)	
Neutral	TB5
Line	TB2
Ground	TB3
Single Feed 240 VAC (nominal)	
Line 1	TB2
Line 2	TB5
Ground	TB3

Place a voltmeter on the power feed(s) to ensure that the voltage is within the power ratings range (see Figure 1-4, Figure 1-5, and Table 1-2).

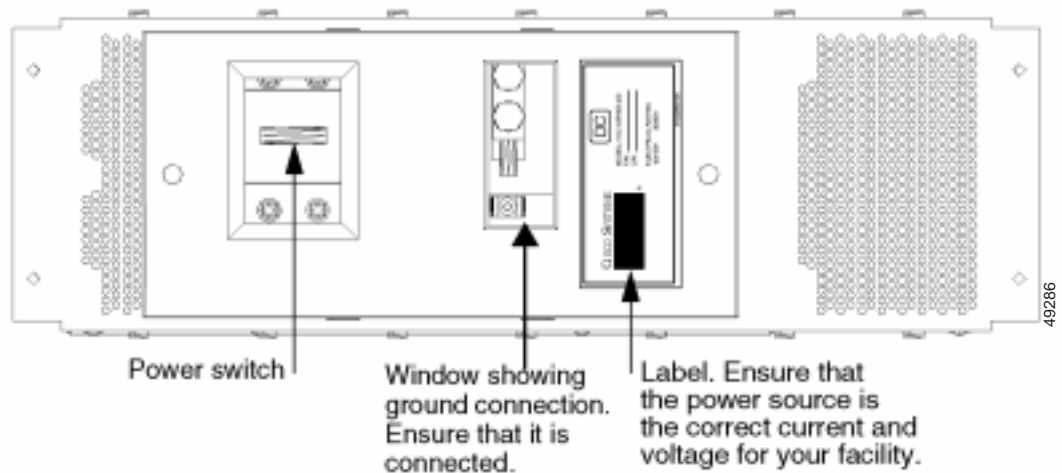
Figure 1-4 *Components of the Power Entry Module (Terminal Block) With Input Power Type Specified—Rear of the VCO*

Figure 1-5 Components of the Power Entry Module (Terminal Block) Without Input Power Type Specified—Rear of the VCO

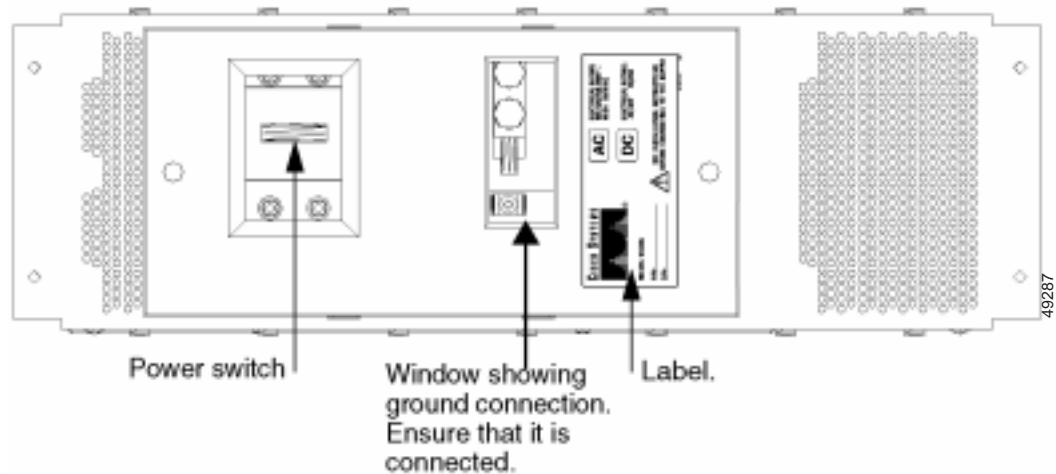


Table 1-2 Power Input Ratings

Source	Range	Current	Frequency
-48 VDC (per feed)	-40 to -60 VDC	20 amps	DC
120 VAC, single phase	100 to 120 VAC	10 amps	50/60 Hz
240 VAC, single phase	208 to 240 VAC	5 amps	50/60 Hz

Connecting the Power Cable



Warning

Before you connect the power cable, ensure that the cable is not plugged in to the source.

The following tools are required to connect the power cable to the power entry module (PEM):

- #2 Phillips-head screwdriver
- 5/16-inch and 7/16-inch nutdrivers
- Wire strippers
- Diagonal cutters
- Crimping tool
- Adjustable torque wrench with 7/16-inch socket

Use the following steps to connect the power cable.



Warning

Do not open the power entry module (PEM) or you will void your Cisco Systems warranty.

Step 1

Use a #2 Phillips-head screwdriver to remove the two screws holding the PEM safety cover and remove the safety cover. See Figure 1-6 and Figure 1-7.

- Step 2** Strip about 0.5 inch (13 mm) of insulation from the end of each power and ground cable to be connected to the PEM.
- Step 3** Slip stripped end of cable into the end of a lug and crimp firmly. Repeat for all cables.
- Step 4** Use a 5/16-inch nutdriver to loosen the hex nuts holding the strain relief(s).
- Step 5** Feed the power source cables through the strain relief(s).
- Step 6** Install each lug at the desired terminal according to the chart on the inside of the PEM safety cover (see Table 1-3). Use two brass 1/4-20 hex head bolts and lockwashers per lug; hand tighten the bolts. Repeat until all lugs are installed.



Note For a single DC feed, you must install two external jumpers: a/rtn to b/rtn and a/bat to b/bat. Jumpers are supplied in the PEM VCO/4K kit.

Table 1-3 Power Input Board Connections

Power Input Board Connections									
Terminal Label	AC Line Feed			Single Line Feed DC		Dual Line Feed DC			
	AC line 1	AC line2	Frame gnd	DC rtn	DC bat	DC a/rtn	DC a/bat	DC b/rtn	DC b/bat
TB1						X			
TB2	X						X		
TB3			X						
TB4				X				X	
TB5		X			X				X

- Step 7** Use an adjustable torque wrench equipped with a 7/16-inch socket to tighten each hex head bolt on every lug to 45 to 61 inches per pound.
- Step 8** Secure the cables into the tie wrap mounts below each terminal using the nylon ties supplied in the VCO/4K PEM kit. Slip a tie through the slots in each mount, wrap the tie around the cable, slide the tie through its lock, tighten and cut off the excess.
- Step 9** *For AC input only:* If necessary, install a plug on the end of the power cable to mate with the supply receptacle. Refer to the OEM instructions supplied with the connector and Table 1-1.
Splice or plug the power cable from the PEM into the AC feed. Splices must be completed in an approved receptacle or junction box. Secure the receptacle or junction box by installing an appropriate cover before proceeding.
- Step 10** Use an ohm meter to measure continuity from the earth ground lug (TB3) to a ground point; resistance should be less than 1 ohm.
- Step 11** With the power switch Off at the PEM, apply power to the feed(s) into the VCO/4K switch.
- Step 12** Use a voltmeter to test the input voltages (see Table 1-2).
- Step 13** Replace the PEM safety cover. Use a #2 Phillips-head screwdriver to replace the two retainer screws.

Figure 1-6 Power Entry Module Connections - Dual DC Feeds

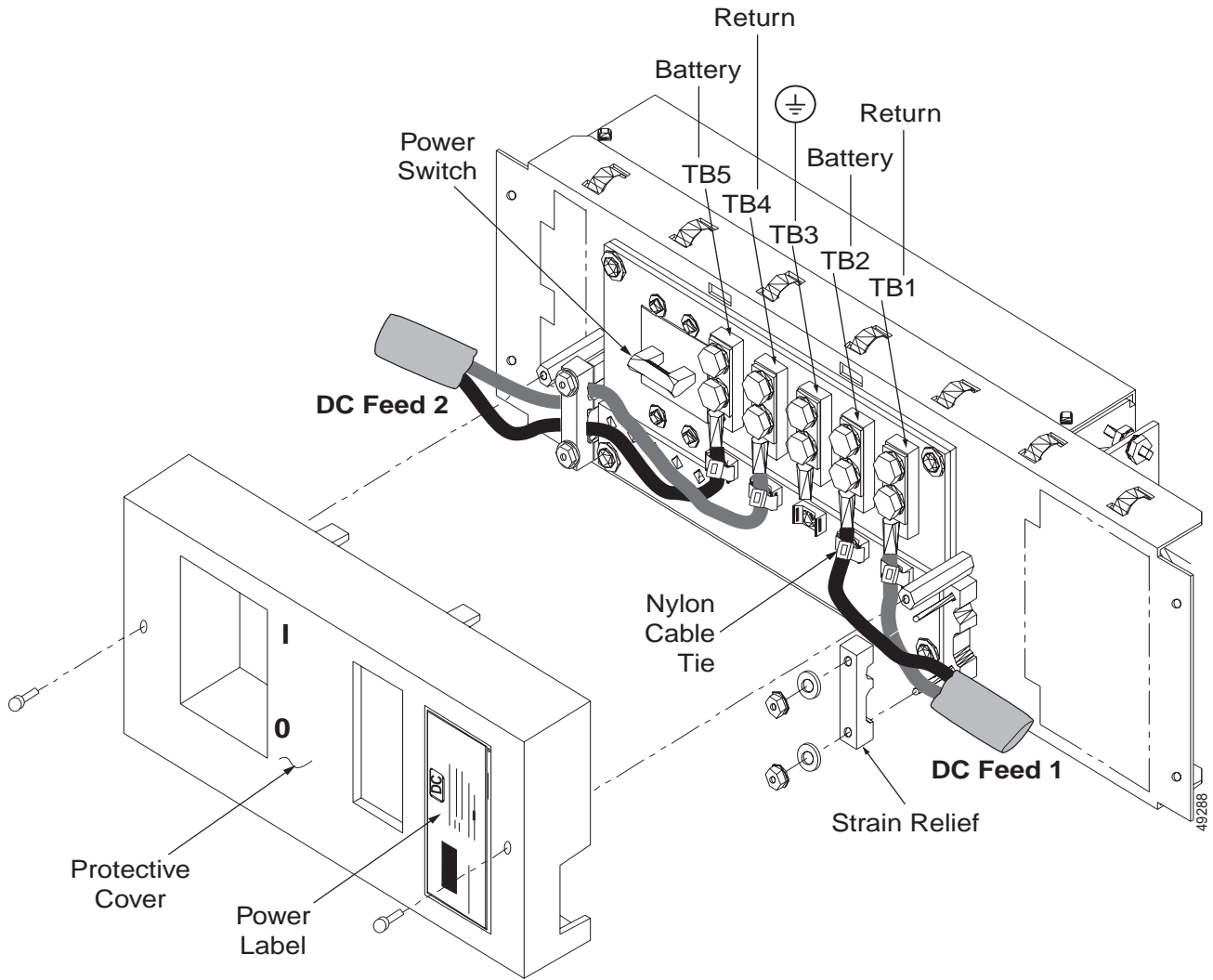
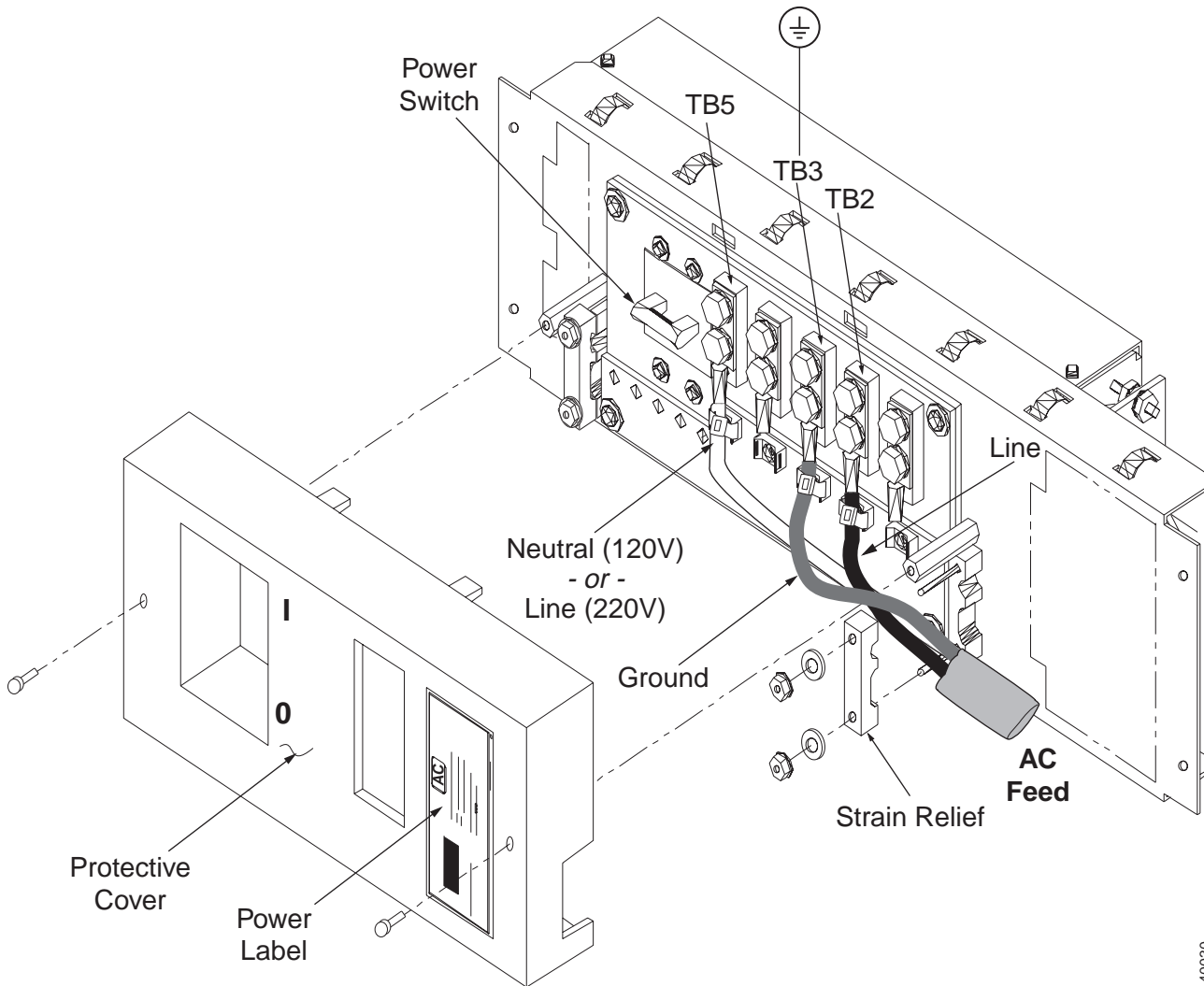


Figure 1-7 Power Entry Module Connections - 120 VAC Feeds



Use the following checklist to ensure that each step is completed:

1. ___ Verify that the fuses are correct before installing power supply modules.
2. ___ Install the power supply modules.
3. ___ Connect the system power supply.
4. ___ Connect the network cables.
5. ___ Connect the peripherals.
6. ___ Connect the external alarms.
7. ___ Connect the VCO/4K to the host computer.
8. ___ Power the system on.
9. ___ Log in.
 - a. Set up the terminal.
 - b. Set up the database.
 - c. Set the timing: external or internal.
 - d. Perform the cutover testing.

LED Indicators

There are two LEDs on the front of the power supply module: the power LED on the left side, and the Ring Generator LED on the right side. Figure 1-1 shows the location of the LEDs.

Power LED

The power LED is on the upper left side of the power supply module. When illuminated, it is either green or red.

- Green indicates that the power is on and operation is normal.
- Red indicates a voltage failure, although the interlock switch is closed and the power is on. Replace either the fuse (on back of the power supply module) or the power supply module. See the “Removing the Power Supply Modules” section on page 1-5.
- When the LED is off, or if it glows a faint red (reduced illumination), the interlock switch is open (power to the module is turned off).

Ring Generator LED

The Ring Generator LED is on the upper right side of the power supply module. When illuminated, it is either green or red.

- Green indicates that a ring generator is installed and working correctly.
- Red indicates a ring generator failure.
- When the LED is off, there is no ring generator present in that power supply module.

Ring Generator

The ring generator is active only when it is installed in the left power supply module. Ring generators can be installed in both power supply modules in a redundant system. However, the ring generator in the right power supply module is not connected to the system and is considered a spare. Power loss to the left power supply module results in loss of the ring generator.

Ring Generator Kit

You can order the Ring Generator Kit from Cisco Systems. It includes the ring generator, label, and bracket. The default voltage and frequency setting is 77 VAC. Contact Cisco Systems if voltage and/or frequency requirements in your country are different.

Part Number	Contact your Cisco Systems sales representative
Power	77 VAC
Output	30 volt-amperes

The Ring Generator Kit includes:

- Ring generator
- Bracket assembly:
 - Two screws
 - Two lock washers
 - Bracket
 - Two standoffs
- Two circuit configuration jumpers (JP6 and JP7)

Installing the Ring Generator

Installation procedures for the ring generator are included in the Ring Generator Kit.



Note

Cisco Systems recommends that you store the installation procedures with this installation manual.

Cable Connections

Set up the network interface, as described in the *Cisco VCO/4K Site Preparation Guide*, before moving the system into the equipment room.



Note

Cisco suggests that you consult a cable management expert for help in planning and installing system cables.
