APPENDIX A

Power Supply Specifications

This appendix describes the Catalyst 6500 series power supplies and provides their specifications. This appendix contains the following sections:

- Power Supply Compatibility Matrix, page A-2
- 950 W AC-Input and DC-Input Power Supplies, page A-5
- 1000 W AC-Input Power Supply, page A-10
- 1300 W AC-Input and DC-Input Power Supplies, page A-13
- 1400 W AC-Input Power Supply, page A-18
- 2500 W AC-Input and DC-Input Power Supplies, page A-23
- 2700 W AC-Input and DC-Input Power Supplies, page A-29
- 3000 W AC-Input Power Supply, page A-36
- 4000 W AC-Input and DC-Input Power Supplies, page A-41
- 6000 W AC-Input and DC-Input Power Supplies, page A-46
- 8700 W AC-Input Power Supply, page A-54
- AC Power Cord Illustrations, page A-63
- Power Supply Redundancy, page A-73

Table A-1 lists the currently available Catalyst 6500 series switch power supplies and the power supply description location.

Table A-1 Catalyst 6500 Series Power Supplies

Power Supply Rating	AC-Input Model Product Number	DC-Input Model Product Number
950 W[1]	PWR-950-AC	PWR-950-DC
1000 W	WS-CAC-1000W	Not Available
1300 W	WS-CAC-1300W	WS-CDC-1300W
1400 W[1]	PWR-1400-AC	Not Available
2500 W	WS-CAC-2500W	WS-CDC-2500W
2700 W[2]	PWR-2700-AC/4	PWR-2700-DC/4
3000 W	WS-CAC-3000W	Not Available

Table A-1 Catalyst 6500 Series Power Supplies (continued)

Power Supply Rating	AC-Input Model Product Number	DC-Input Model Product Number
4000 W	WS-CAC-4000W-US1 WS-CAC-4000W-INT	PWR-4000-DC
6000 W	WS-CAC-6000W	PWR-6000-DC
8700 W	WS-CAC-8700W-E	Not Available

1. For use with the Catalyst 6503 and Catalyst 6503-E switches only.
2. For use with the Catalyst 6504-E switch only.

Note The Catalyst 6500 series switches allow you to mix AC-input and DC-input power supplies in the same chassis.

Note Many telco organizations require a –48 VDC power supply to accommodate their power distribution systems. From an operational perspective, the DC-input power supply has the same characteristics as the AC-input version.

Power Supply Compatibility Matrix

Table A-2 lists the compatibility of the power supplies with the Catalyst 6500 switch chassis.

Table A-2 Catalyst 6500 Series Switch Supported Power Supply Configurations

Platform	Supported Power Supplies	Chassis/Power Supply Restrictions
Catalyst 6503	• 950 W AC-input and DC-input • 1400 W AC-input	• The 950 W AC-input power supply requires a PEM-15A-AC Power Entry Module (PEM). • The 1400 W AC-input power supply requires a PEM-20A-AC+ Power Entry Module (PEM).
Catalyst 6503-E	• 950 W AC-input and DC-input • 1400 W AC-input	• The 950 W AC-input power supply requires a PEM-15A-AC Power Entry Module (PEM). • The 1400 W AC-input power supply requires a PEM-20A-AC+ Power Entry Module (PEM).
Catalyst 6504-E	• 2700 W AC-input and DC-input	No restrictions

Table A-2 Catalyst 6500 Series Switch Supported Power Supply Configurations (continued)

Platform	Supported Power Supplies	Chassis/Power Supply Restrictions
Catalyst 6506	• 1000 W AC-input • 1300 W AC-input and DC-input • 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	The 6000 W AC-input, 6000 W DC-input, and the 8700 W AC-input power supplies are limited to 4000 W when they are installed in the Catalyst 6506 switch chassis.
Catalyst 6506-E	• 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	No restrictions.
Catalyst 6509	• 1000 W AC-input • 1300 W AC-input, and DC-input • 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	The 6000 W AC-input, 6000 W DC-input, and the 8700 W AC-input power supplies are limited to 4000 W when they are installed in the Catalyst 6509 switch chassis.
Catalyst 6509-E	• 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	No restrictions.
Catalyst 6509-NEB	• 1000 W AC-input • 1300 W AC-input and DC-input • 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	The 6000 W AC-input, 6000 W DC-input, and the 8700 W AC-input power supplies are limited to 4000 W when they are installed in the Catalyst 6509-NEB switch chassis.

Table A-2 Catalyst 6500 Series Switch Supported Power Supply Configurations (continued)

Platform	Supported Power Supplies	Chassis/Power Supply Restrictions
Catalyst 6509-NEB-A	• 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	The 6000 W AC-input, 6000 W DC-input, and the 8700 W AC-input power supplies are limited to 4500 W maximum output when they are installed in the Catalyst 6509-NEB-A switch chassis.
Catalyst 6509-V-E	• 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	No restrictions.
Catalyst 6513	• 2500 W AC-input and DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	The 8700 W AC-input power supply is limited to 6000 W maximum output when it is installed in the Catalyst 6513 switch chassis.
Catalyst 6513-E	• 2500 W DC-input • 3000 W AC-input • 4000 W AC-input and DC-input • 6000 W AC-input and DC-input • 8700 W AC-input	No restrictions.

950 W AC-Input and DC-Input Power Supplies

The 950 W AC-input (PWR-950-AC) and DC-input (PWR-950-DC) power supplies can be installed in the Catalyst 6503 and Catalyst 6503-E switch chassis only. Due to form factor differences, the 950 W AC-input and DC-input power supplies cannot be installed in any other Catalyst 6500 series switch chassis.

The 950 W power supplies (see Figure A-1) do not connect directly to source AC or source DC but use Power Entry Modules (PEMs), located on the front of the Catalyst 6503 and Catalyst 6503-E switch chassis, to connect the site power source to the power supply located in the back of the chassis. The form factor is the same for the AC-input and DC-input power supplies.

The AC-input PEM (shown in Figure A-2) and DC-input PEM (shown in Figure A-3) provide an input power connection on the front of the switch chassis to connect the site power source to the power supply. You can connect the DC-input power supply to the power source with heavy gauge wiring connected to a terminal block. The actual wire gauge size is determined by local electrical codes and restrictions.

Note The system (NEBS) ground serves as the primary safety ground for Catalyst 6503 and Catalyst 6503-E chassis that are equipped with 950 W DC-input power supplies and DC-input PEMs. The DC-input power supplies for these chassis do not have a separate ground.

The PEMs have an illuminated power switch (AC-input model only), current protection, surge and EMI suppression, and filtering functions.

Figure A-1 950 W AC- and DC-Input Power Supplies

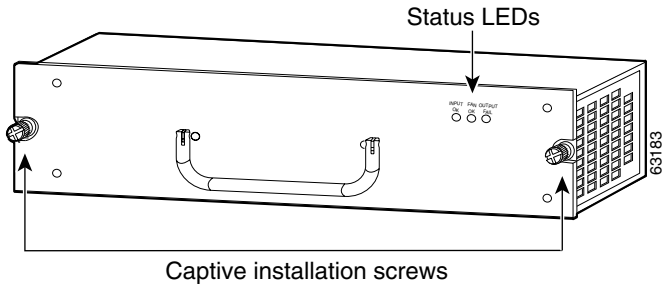


Figure A-2 950 W AC-Input PEM (PEM-15A-AC)

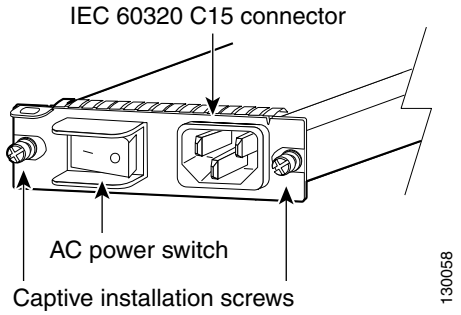
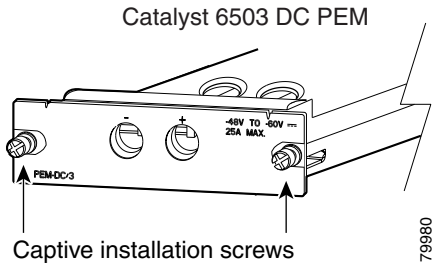


Figure A-3 DC Power Entry Module (PEM)



950 W Power Supply Specifications

Table A-3 lists the specifications for the 950 W AC-input power supply.

Table A-3 950 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC) **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 12 A @ 120 VAC • 6 A @ 230 VAC
AC-input frequency	50/60 Hz (nominal)

Table A-3 950 W AC-Input Power Supply Specifications (continued)

Specification	Description
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—15 A • For International—Circuits sized to local and national codes • All Catalyst 6500 series AC-input power supplies require single-phase source AC. • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	950 W maximum (100–240 VAC)
Power supply output	• 15 A @ +1.5 VDC • 2.5 A @ +3.3 VDC • 19.15 A @ +50 VDC
Output holdup time	20 ms minimum
kVA rating[1]	1.32 kVA
Heat dissipation	4441 BTU/hour (approx.)
Weight	8.2 lb (3.7 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-4 lists the specifications for the 950 W DC-input power supply.

Table A-4 950 W DC-Input Power Supply Specifications

Specification	Description
DC-input voltage	–48 VDC to –60 VDC continuous
DC-input current	• 28 A @ –48 VDC • 23 A @ –60 VDC
Power supply output capacity	950 W
Power supply output	• 15 A @ +1.5 VDC • 2.5 A @ +3.3 VDC • 19.15 A @ +50 VDC
Output holdup time	8 ms
Heat dissipation	4632 BTU/hour (approx.)
Weight	8.4 lb (3.8 kg)

Table A-5 lists the power supply LEDs and their meanings.

Table A-5 950 W AC-Input and DC-Input Power Supply LEDs

LED	Meaning
INPUT OK	AC-input power supplies: • Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the PEM is turned off. DC-input power supplies: • Green—Source DC voltage is OK. (–40.5 VDC or greater.) • Off—Source DC voltage falls below –33 VDC or is not present at the PEM.
FAN OK	Green—Power supply fan is operating properly. Off—Power supply fan failure is detected.
OUTPUT FAIL	Red—Problem with one or more of the DC-output voltages of the power supply is detected. Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

950 W Power Supply AC Power Cords

Table A-6 lists the 950 W AC-input power supply AC power cords specifications. These power cords plug into the 950 W PEM(PEM-15A-AC), not directly into the power supply. The table includes references to power cord illustrations.

Note All 950 W power supply power cords are 8 feet 2 inches (2.5 meters) in length.

Note All 950 W power supply power cords have an IEC60320/C15 appliance connector at one end. The appliance connector has a 90° left bend.

Table A-6 950 W AC-Input Power Supply Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7KACR=	IRAM 2073	10 A, 250 VAC	Figure A-25
Australia, New Zealand	CAB-AC10A-90L-AU=	SAA AS 3112	10 A, 250 VAC	Figure A-20
Continental Europe	CAB-AC10A-90L-EU=	CEE 7/7	10 A, 250 VAC	Figure A-21
Italy	CAB-AC10A-90L-IT=	CEI 23-16/7	10 A, 250 VAC	Figure A-22
Japan, North America	CAB-AC15A-90L-US=	NEMA 5-15	15 A, 125 VAC	Figure A-23
United Kingdom	CAB-AC10A-90L-UK=	BS 1363[1]	10 A, 250 VAC	Figure A-24

1. Plug contains a 13 A fuse.

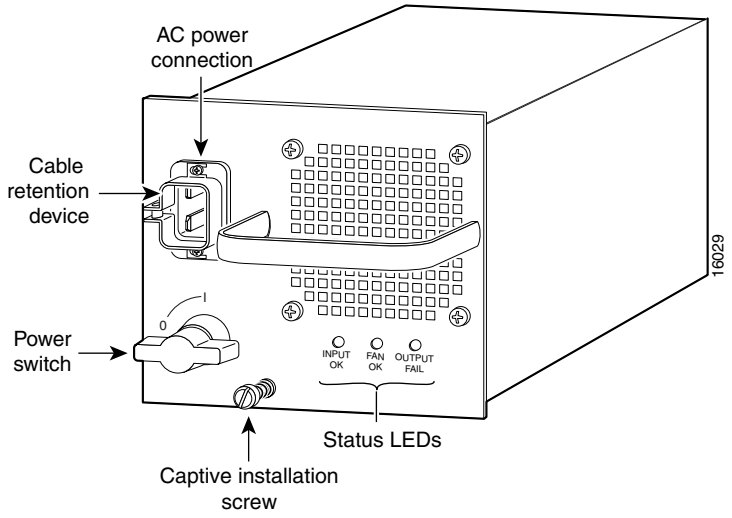
1000 W AC-Input Power Supply

The 1000 W AC-input power supply (WS-CAC-1000W) is supported in the following Catalyst 6500 series switches:

- Catalyst 6506
- Catalyst 6509
- Catalyst 6509-NEB

The 1000 W power supply (shown in Figure A-4) shares the same form factor as the 1300 W, 2500 W, 3000 W, 4000 W, and 6000 W AC-input power supplies.

Figure A-4 1000 W AC-Input Power Supply



1000 W Power Supply Specifications

Table A-7 lists the specifications for the 1000 W AC-input power supply.

Table A-7 1000 W Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC) **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 12 A @ 120 VAC • 6 A @ 230 VAC
AC-input frequency	50/60 Hz (nominal)
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—15 A or 20 A • For International—Circuits sized to local and national codes • All Catalyst 6500 series AC-input power supplies require single-phase source AC. • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.

Table A-7 1000 W Power Supply Specifications (continued)

Specification	Description
Power supply output capacity	1000 W
Power supply output	• 15 A @ +3.3 VDC • 5 A @ +5 VDC • 6 A @ +12 VDC • 20.3 A @ +42 VDC
Output holdup time	20 ms minimum
kVA rating[1]	1.25 kVA
Heat dissipation	4213 BTU/hour (approx.)
Weight	14.8 lb (6.7 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-8 list the power supply LEDs and their meanings.

Table A-8 1000 W Power Supply LEDs

LED	Meaning
INPUT OK	• Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply is detected. • Off—DC-output voltage with acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

1000 W Power Supply AC Power Cords

Table A-9 lists the specifications for the AC power cords that are available for the 1000 W AC-input power supply. The table includes references to power cord illustrations.

Note All 1000 W power supply power cords are 8 feet 2 inches (2.5 meters) in length.

Note All 1000 W power supply power cords have an IEC60320/C15 appliance plug at one end.

Table A-9 1000 W AC-Input Power Supply Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7KACR=	IRAM 2073	10 A, 250 VAC	Figure A-25
Australia, New Zealand	CAB-7KACA=	SAA AS 3112	15 A, 250 VAC	Figure A-26
Continental Europe	CAB-7KACE=	CEE 7/7	16 A, 250 VAC	Figure A-27
Italy	CAB-7KACI=	CEI 23-16/7	10 A, 250 VAC	Figure A-28
Japan, North America	CAB-7KAC-15=	NEMA 5-15	15 A, 125 VAC	Figure A-29
United Kingdom	CAB-7KACU=	BS 1363[1]	10 A, 250 VAC	Figure A-30

1. Plug contains a 13 A fuse.

1300 W AC-Input and DC-Input Power Supplies

The 1300 W AC-input power supply (WS-CAC-1300W) and 1300 W DC-input power supply (WS-CDC-1300W) are supported in the following Catalyst 6500 series switches:

- Catalyst 6506
- Catalyst 6509
- Catalyst 6509-NEB

The 1300 W power supply (see Figure A-5 for the 1300 W AC-input power supply and Figure A-6 for the 1300 W DC-input power supply) shares the same form factor as the 1000 W, 2500 W, 3000 W, 4000 W, and 6000 W AC-input power supplies.

Figure A-5 1300 W AC-input Power Supply

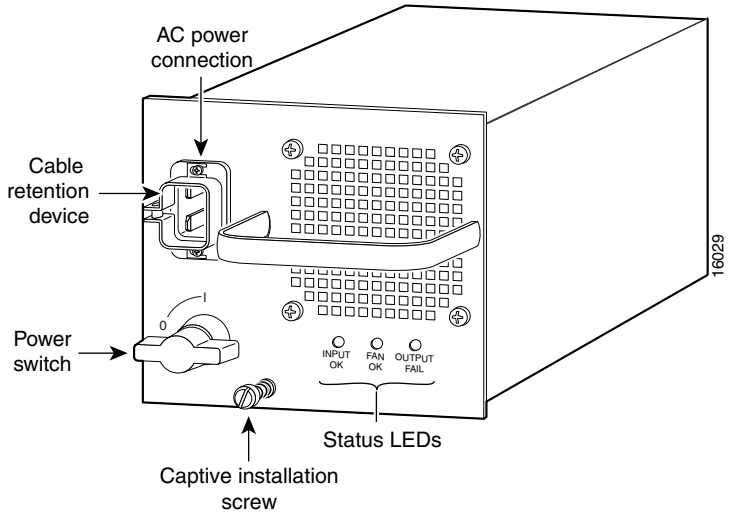
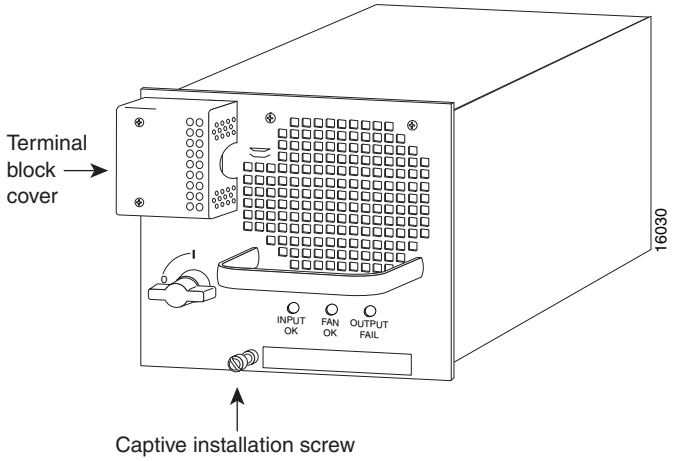


Figure A-6 1300 W DC-Input Power Supply



1300 W Power Supply Specifications

Table A-11 lists the specifications for the 1300 W AC-input power supply.

Table A-10 1300 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 16 A @ 120 VAC • 8 A @ 230 VAC
AC-input frequency	50/60 Hz (nominal) (±3 Hz for full range)
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—15 A or 20 A • For International—Circuits sized to local and national codes • All Catalyst 6500 series AC-input power supplies require single-phase source AC. • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	• 1300 W maximum (AC-input) • 1360 W maximum (DC-input)
Power supply output	• 15 A @ +3.3 VDC • 5 A @ +5 VDC • 6 A @ +12 VDC • 27.46 A @ +42 VDC
Output holdup time	20 ms minimum

Table A-10 1300 W AC-Input Power Supply Specifications (continued)

Specification	Description
kVA rating[1]	1.625 kVA
Heat dissipation	5478 BTU/hour (approx.)
Weight	18.4 lb (8.3 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-11 lists the specifications for the 1300 W DC-input power supply.

Table A-11 1300 W DC-Input Power Supply Specifications

Specification	Description
DC-input voltage	–48 VDC to –60 VDC continuous
DC-input current	• 39 A @ –48 VDC • 31 A @ –60 VDC
Power supply output capacity	1360 W maximum (DC-input)
Power supply output	• 15 A @ +3.3 VDC • 5 A @ +5 VDC • 6 A @ +12 VDC • 28.9 A @ +42 VDC
DC input terminal block	Accepts 3 AWG to 10 AWG copper conductors. Actual size of the wire needed is determined by the installer or local electrician. Terminal block material is rated at 120°C.
Output holdup time	8 ms
Heat dissipation	6447 BTU/hour (approx.)
Weight	21.0 lb (9.5 kg)

Table A-12 lists the 1300 W power supply LEDS and their meanings.

Table A-12 1300 W AC-Input and DC-Input Power Supply LEDs

LED	Meaning
INPUT OK	AC-input power supplies: • Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply turned off. DC-input power supplies: • Green—Source DC voltage is OK. (Input voltage is –40.5 VDC or greater.) • Off—Source DC voltage falls below –33 VDC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply is detected. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

1300 W Power Supply AC Power Cords

Table A-13 lists the specifications for the AC power cords that are available for the 1300 W AC-input power supply. The table includes references to power cord illustrations.

Note All 1300 W power supply power cords are 14 feet (4.3 meters) in length.

Note All 1300 W power supply power cords have an IEC60320/C19 appliance connector at one end.

Table A-13 1300 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR=	IRAM 2073	10 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-7513ACA=	SAA AS 3112	15 A, 250 VAC	Figure A-32
Continental Europe	CAB-7513ACE=	CEE 7/7	16 A, 250 VAC	Figure A-33
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35
Japan, North America	CAB-7513AC=	NEMA 5-20[1]	20 A, 125 VAC	Figure A-36
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
South Africa	CAB-7513ACSA=	IEC 884-1	16 A, 250 VAC	Figure A-38
Switzerland	CAB-ACS-10=	SEV 1011	10 A, 250 VAC	Figure A-39
United Kingdom	CAB-7513ACU=	BS 1363[2]	13 A, 250 VAC	Figure A-40
Power Distribution Unit (PDU)[3]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47

1. For Japan, ask your local electrical contractor to prepare the NEMA 5-20 power plug.
2. Plug contains a 13 A fuse.
3. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

1400 W AC-Input Power Supply

The 1400 W AC-input power supply (PWR-1400-AC) can be installed in the Catalyst 6503 switch and Catalyst 6503-E switch chassis only. Due to form factor differences, the 1400 W AC-input power supply cannot be installed in any other Catalyst 6500 series switch chassis.

The 1400 W power supplies (see Figure A-7) do not connect directly to source AC but use power entry modules (PEMs), located on the front of the Catalyst 6503 and Catalyst 6503-E switch chassis, to connect the site power source to the power supply located in the back of the chassis.

The AC-input PEM (PEM-20A-AC+) (shown in Figure A-8) provides an input power connection on the front of the router chassis to connect the site power source to the power supply.

The PEMs have an illuminated power switch, current protection, surge and EMI suppression, and filtering functions.

Figure A-7 1400 W AC-Input Power Supply (PWR-1400-AC)

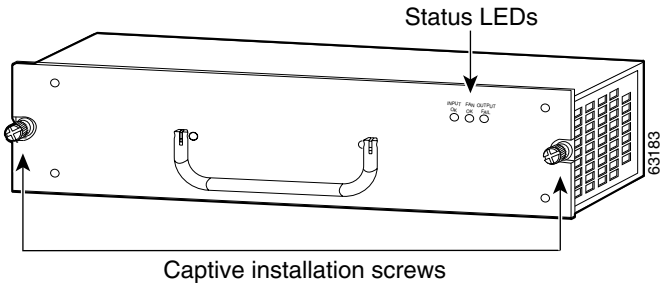
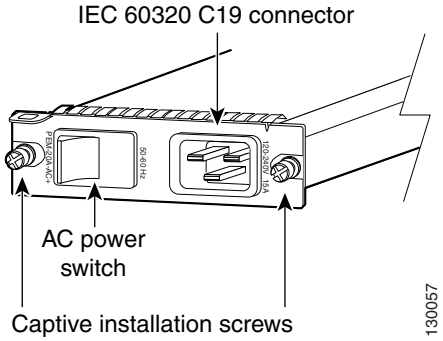


Figure A-8 1400 W AC-Input PEM (PEM-20A-AC+)



1400 W Power Supply Specifications

Table A-14 lists the specifications for the 1400 W AC-input power supply.

Table A-14 1400 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 16 A @ 120 VAC • 8 A @ 230 VAC
AC-input frequency	50/60 Hz (nominal) (±3 Hz for full range)

Table A-14 1400 W AC-Input Power Supply Specifications (continued)

Specification	Description
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits sized to local and national codes • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	1400 W
Power supply output	• 15 A @ +1.5 V • 2.5 A @ +3.3 V • 27.4 A @ +50 V
Output holdup time	20 ms minimum
kVA rating[1]	1.75 kVA
Heat dissipation	5976 BTU/hour (approx.)
Weight	7.8 lb (3.5 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-15 lists the 1400 W AC-input power supply LEDs and their meanings.

Table A-15 1400 W AC-Input Power Supply LEDs

LED	Meaning
INPUT OK	• Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply is detected. • DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

1400 W Power Supply AC Power Cords

Table A-16 lists the specifications for the AC power cords that are available for the 1400 W AC-input power supply. These power cords plug into the 1400 W PEM (PEM-20A-AC+); not directly into the power supply. The table includes references to power cord illustrations.

Note All 1400 W power supply power cords are 14 feet (4.3 meters) in length.

Note All 1400 W power supply power cords have an IEC60320/C19 appliance plug at one end.

Table A-16 1400 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-7513ACA=	SAA AS 3112	15 A, 250 VAC	Figure A-32
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-7513ACE=	CEE 7/7	16 A, 250 VAC	Figure A-33
	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35
Japan, North America	CAB-7513AC=	NEMA 5-20[1]	20 A, 125 VAC	Figure A-36
	CAB-AC-2500W-US1=	NEMA 6-20[2]	16 A, 250 VAC	Figure A-43
	CAB-AC-C6K-TWLK=	NEMA L6-20[3]	16 A, 250 VAC	Figure A-44
South Africa	CAB-7513ACSA=	IEC 884-1	16 A, 250 VAC	Figure A-38
Switzerland	CAB-ACS-10=	SEV 1011	10 A, 250 VAC	Figure A-39
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45
United Kingdom	CAB-7513ACU=	BS 1363	13 A, 250 VAC[4]	Figure A-40
Power Distribution Unit (PDU)[5]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47

1. For operation in Japan, ask your local electrical contractor to prepare the NEMA 5-20 power plug.
2. For operation in Japan, ask your local electrical contractor to prepare the NEMA 6-20 power plug.
3. For operation in Japan, ask your local electrical contractor to prepare the NEMA L6-20 power plug.
4. Plug contains a 13 A fuse.
5. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

2500 W AC-Input and DC-Input Power Supplies

The 2500 W AC-input power supply (WS-CAC-2500W) and 2500 W DC-input power supply (WS-CDC-2500W) are supported in the following Catalyst 6500 series switches:

- Catalyst 6506
- Catalyst 6506-E
- Catalyst 6509
- Catalyst 6509-E
- Catalyst 6509-NEB
- Catalyst 6509-NEB-A
- Catalyst 6509-V-E
- Catalyst 6513
- Catalyst 6513-E (DC-input power supply only)

The 2500 W power supplies, shown in Figure A-9 and Figure A-10, share the same form factor as the 1000 W, 1300 W, 3000 W, 4000 W, and 6000 W AC-input power supplies.

Note With a fully populated Catalyst 6513 switch, two 2500 W power supplies are not fully redundant. If you operate the 2500 W power supply at the low range input (100 to 120 VAC), it is not redundant in a fully populated Catalyst 6509, Catalyst 6509-E, Catalyst 6509-NEB, Catalyst 6509-NEB-A, or Catalyst 6509-V-E switch.

Note The 2500 W AC-input power supply needs 220 VAC to deliver 2500 W of power. When powered with 110 VAC, it delivers only 1300 W. In addition, the power supply needs 16 A, regardless of whether it is plugged into 110 VAC or 220 VAC.

Figure A-9 2500 W AC-Input Power Supply

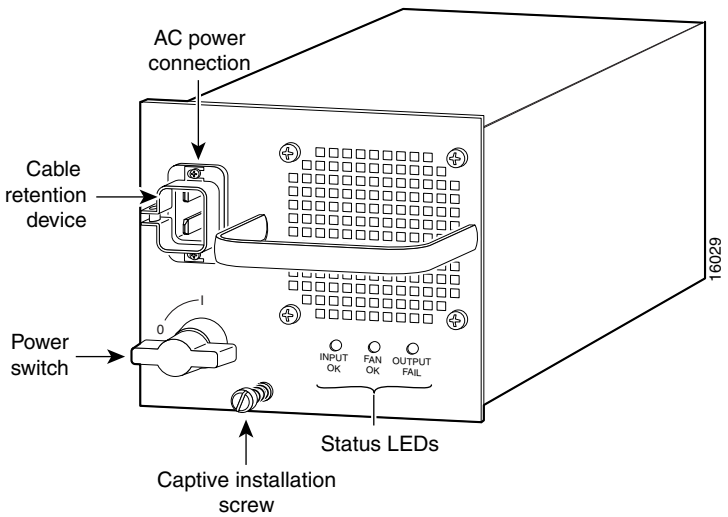
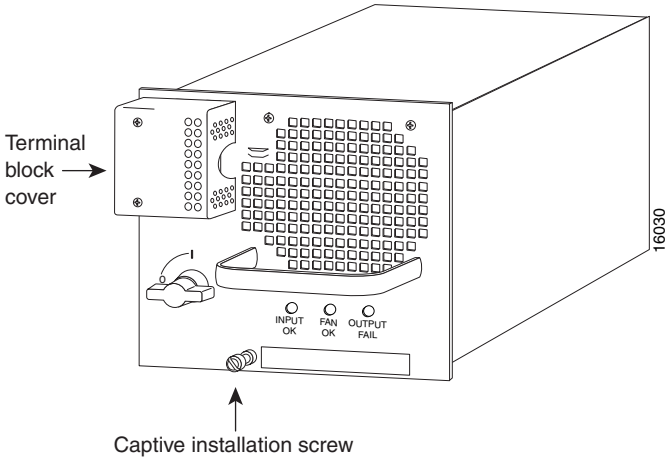


Figure A-10 2500 W DC-input Power Supply



2500 W Power Supply Specifications

Table A-17 lists the specifications for the 2500 W AC-input and DC-input power supplies.

Table A-17 2500 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	16 A maximum at 230 VAC at 2500 W output 16 A maximum at 120 VAC at 1300 W output
AC-input frequency	50/60 Hz (nominal) (±3% for full range)

Table A-17 2500 W AC-Input Power Supply Specifications (continued)

Specification	Description
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits sized to local and national codes • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	• 1300 W maximum (100–120 VAC) • 2500 W maximum (200–240 VAC)
Power supply output	• 100/120 VAC operation – 15.5 A @ +3.3 VDC – 5 A @ +5 VDC – 10 A @ +12 VDC – 27.5 A @ +42 VDC • 200/240 VAC operation – 15 A @ +3.3 VDC – 5 A @ +5 VDC – 10 A @ +12 VDC – 55.5 A @ +42 VDC
Output holdup time	20 ms minimum
kVA rating[1]	3520 W (total input power) or 3.6 KVA (high-line operation)
Heat dissipation	10,939 BTU/hour (approx.)
Weight	17.0 lb (7.7 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-18 lists the specifications for the 2500 W DC-input power supply.

Table A-18 2500 W DC-Input Power Supply Specifications

Specification	Description
DC-input voltage	–48 VDC to –60 VDC continuous
DC-input current	• 80 A @ –40.5 VDC • 70 A @ –48 VDC • 55 A @ –60 VDC
Power supply output capacity	2500 W maximum (–48 to –60 VDC)
Power supply output	• 15 A @ +3.3 VDC • 5 A @ +5 VDC • 10 A @ +12 VDC • 55.5 A @ +42 VDC
DC input terminal block	Accepts 2–14 AWG copper conductors. Actual size of the wire needed is determined by the installer or local electrician. Terminal block material rated at 150°C.
Output holdup time	• 20 ms minimum (AC-input power supply) • 4 ms (DC-input power supply)
Heat dissipation	• 10,939 BTU/hour (approx.) AC-input power supply • 11,377 BTU/hour (approx.) DC-input power supply
Weight	20.2 lb (9.2 kg)

Table A-19 lists the power supply LEDs and their meanings.

Table A-19 2500 W AC-Input and DC-Input Power Supply LEDs

LED	Meaning
INPUT OK	AC-input power supplies: • Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off. DC-input power supplies: • Green—Source DC voltage is OK. (Input voltage is –40.5 VDC or greater.) • Off—Source DC voltage falls below –33 VDC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

2500 W Power Supply AC Power Cords

Table A-20 lists the specifications for the AC power cords that are available for the 2500 W AC-input power supply. The table includes references to power cord illustrations.

Note All 2500 W power supply power cords are 14 feet (4.3 meters) in length.

Note All 2500 W power supply power cords have an IEC60320/C19 appliance connector at one end.

Table A-20 2500 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= or CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-AC-16A-AUS=	AU20S3	16 A, 250 VAC	Figure A-46
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Japan, North America 200–240 VAC operation	CAB-AC-2500W-US1=	NEMA 6-20 (nonlocking plug)	16 A, 250 VAC	Figure A-43
Japan, North America 200–240 VAC operation	CAB-AC-C6K-TWLK=	NEMA L6-20 (locking plug)	16 A, 250 VAC	Figure A-44
Japan, North America 100–120 VAC operation[1]	CAB-7513AC=	NEMA 5-20	20 A, 125 VAC	Figure A-36
Power Distribution Unit (PDU)[2]	CAB-C19-CBN	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45

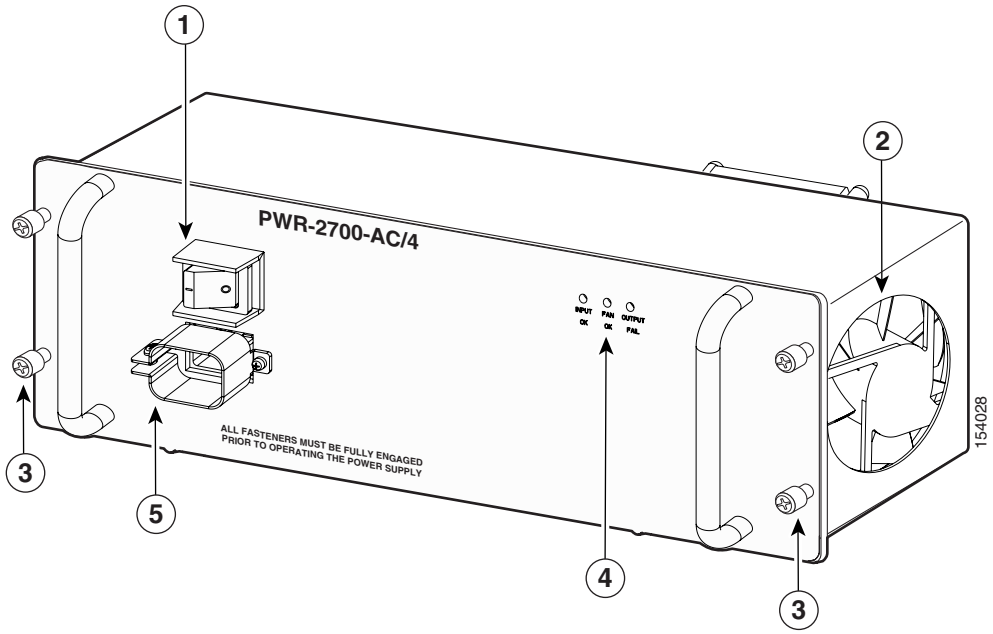
1. The 2500 W power supply operating on 110 VAC delivers 1300 W.
2. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

2700 W AC-Input and DC-Input Power Supplies

The 2700 W AC-input power supply (PWR-2700-AC/4) and 2700 W DC-input power supply (PWR-2700-DC/4) are supported only in the Catalyst 6504-E switch. See Figure A-11 for the 2700 W AC-input power supply and Figure A-12 for the 2700 W DC-input power supply.

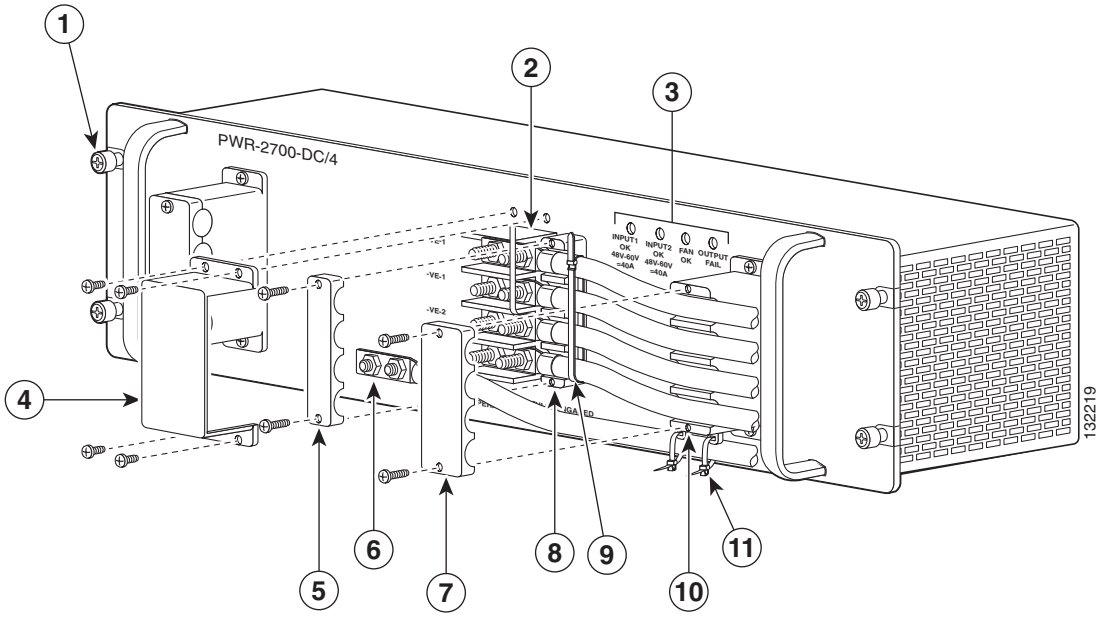
Note The 2700 W AC-input power supply needs 220 VAC to deliver 2700 W of power. When powered with 110 VAC, it delivers only 1350 W. In addition, the power supply needs 16 A, regardless of whether it is plugged into 110 VAC or 220 VAC.

Figure A-11 2700 W AC-Input Power Supply



1	Power on/off switch (I/O)	**4**	Status LEDs
2	Power supply fan	**5**	AC In receptacle
3	Captive installation screw (4x)		

Figure A-12 2700 W DC-Input Power Supply



1	Captive installation screw (4x)	**7**	Fixed cable guide, top half
2	Source DC terminal block	**8**	Detached cable guide, bottom half
3	Status LEDs	**9**	Tie-wrap (for source DC cables)
4	Terminal block cover	**10**	Fixed cable guide, bottom half
5	Detached cable guide, top half	**11**	Tie-wrap (for ground cable)
6	Ground terminal block		

2700 W Power Supply Specifications

Table A-22 lists the specifications for the 2700 W AC-input power supply.

Table A-21 2700 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 16 A maximum at 230 VAC at 2700 W output • 16 A maximum at 120 VAC at 1350 W output
AC-input frequency	50/60 Hz (nominal) (±3% for full range)
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits sized to local and national codes • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	• 1350 W maximum (100–120 VAC) • 2700 W maximum (200–240 VAC)

Table A-21 2700 W AC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output	• 100/120 VAC operation – 15 A @ +1.5 VDC – 2.5 A @ +3.3 VDC – 27.49 A @ +50 VDC • 200/240 VAC operation – 15 A @ +1.5 VDC – 2.5 A @ +3.3 VDC – 55.61 A @ +50 VDC
Output holdup time	20 ms minimum
kVA rating[1]	3.4 KVA (high-line operation)
Heat dissipation	11,238 BTU/hour (approx.)
Weight	18.5 lb (8.4 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-22 lists the 2700 W DC-input power supply specifications.

Table A-22 2700 W DC-Input Power Supply Specifications

Specification	Description
DC-input voltage	• –48 VDC @ 37 A for nominal –48 V battery backup system (operating range: –40.5 VDC to –56 VDC) • –60 VDC @ 29 A for nominal –60 V battery backup system (operating range: –55 VDC to –72 VDC)
DC-input current (per DC input)	• 43 A @ –40.5 VDC • 37 A @ –48 VDC • 29 A @ –60 VDC **Note** For multiple DC input power supplies, each DC input must be protected by a dedicated circuit breaker or a fuse. The circuit breaker or the fuse must be sized according to the power supply input power rating and any local or national electrical code requirements.
Power supply output capacity	• 1350 W maximum (–48 to –60 VDC, with one DC input) • 2700 W maximum (–48 to –60 VDC, with two DC inputs)

Table A-22 2700 W DC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output	• One DC input operation (1350 W operation) – 15 A @ +1.5 VDC – 5 A @ +3.3 VDC – 27.49 A @ +50 VDC • Two DC inputs operation (2700 W operation – 15 A @ +1.5 VDC – 5 A @ +3.3 VDC – 55.61 A @ +50 VDC
DC input terminal block	Accepts 2–14 AWG copper conductors. Actual size of the wire needed is determined by the installer or local electrician. Terminal block material rated at 150°C.
Output holdup time	4 ms
kVA rating[1]	3.5 KW
Heat dissipation	11,968 BTU/hour (approx.)
Weight	21.0 lb (9.5 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-23 lists the power supply LEDs and their meanings.

Table A-23 2700 W AC-Input and DC-Input Power Supply LEDs

LED	Meaning
INPUT 1 OK INPUT 2 OK (DC-input power supply only)	AC-input power supplies: • Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off. DC-input power supplies: • Green—Source DC is OK. (Input voltage is –40.5 VDC or greater.) • Off—Source DC voltage falls below –33 VDC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

2700 W Power Supply AC Power Cords

Table A-24 lists the specifications for the AC power cords that are available for the 2700 W AC-input power supply. The table includes references to power cord illustrations.

Note All 2700 W power supply power cords are 14 feet (4.3 meters) in length.

Note All 2700 W power supply power cords have an IEC60320/C19 appliance connector at one end.

Table A-24 2700 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= or CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-AC-16A-AUS=	AU20S3	16 A, 250 VAC	Figure A-45
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35
Japan, North America 200–240 VAC operation	CAB-AC-2500W-US1=	NEMA 6-20 (nonlocking plug)	16 A, 250 VAC	Figure A-43
Japan, North America 200–240 VAC operation	CAB-AC-C6K-TWLK=	NEMA L6-20 (locking plug)	16 A, 250 VAC	Figure A-44
Japan, North America 100–120 VAC operation	CAB-7513AC=	NEMA 5-20	20 A, 125 VAC	Figure A-36
Power Distribution Unit (PDU)[1]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47
South Africa	CAB-7513ACSA=	IEC 884-1	16 A, 250 VAC	Figure A-38
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45

1. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

3000 W AC-Input Power Supply

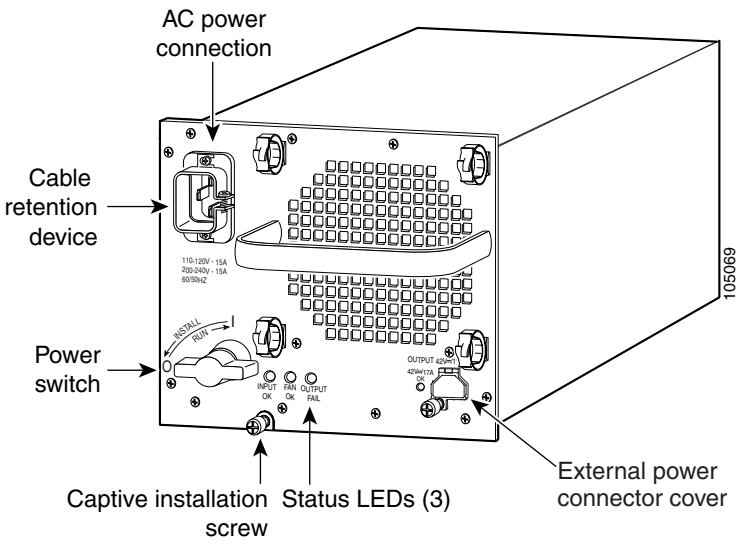
The 3000 W AC-input power supply (WS-CAC-3000W) is supported in the following Catalyst 6500 series switches:

- Catalyst 6506
- Catalyst 6506-E
- Catalyst 6509
- Catalyst 6509-E
- Catalyst 6509-NEB
- Catalyst 6509-NEB-A
- Catalyst 6509-V-E
- Catalyst 6513
- Catalyst 6513-E

The 3000 W power supply (see Figure A-13) shares the same form factor as the 1000 W, 1300 W, 2500 W, 4000 W, and 6000 W AC-input power supplies.

Note The 3000 W AC-input power supply needs 220 VAC to deliver 3000 W of power. When operating with 110 VAC, it delivers only 1400 W. In addition, the power supply needs 16 A, regardless of whether it is plugged into 110 VAC or 220 VAC.

Figure A-13 3000 W AC-Input Power Supply



3000 W Power Supply Specifications

Table A-25 lists the specifications for the 3000 W AC-input power supply.

Table A-25 3000 W Power Supply Specifications

Specification	Description
AC-input type	Autoranging input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	• 16 A @ 200 VAC (3000 W output) • 16 A @ 100 VAC (1400 W output)
AC-input frequency	50/60 Hz (nominal) (±3% for full range)
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits sized to local and national codes • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Power supply output capacity	• 1400 W maximum (100–120 VAC) • 3000 W maximum (200–240 VAC)

Table A-25 3000 W Power Supply Specifications (continued)

Specification	Description
Power supply output	• 100/120 VAC operation – 25.0 A @ +3.3 V – 5 A @ +5 V – 12 A @ +12 V – 27.89 A @ +42 V • 200/240 VAC operation – 25.0 A @ +3.3 V – 5 A @ +5 V – 12 A @ +12 V – 65.98 A @ +42 V
Front panel power connector	A two-pin male Molex connector is located in the lower right corner of the power supply front panel. The connector provides 42 VDC at a maximum of 17 A. This connector provides power to the WS-6509-NEB-UPGRD kit fan assembly through a power harness also provided in the kit. A hinged protective flap secured by a captive screw covers the connector when it is not in use.
Output holdup time	20 ms minimum
kVA rating[1]	3520 W (total input power) or 3.6 KVA (high-line operation)
Heat dissipation	12,046 BTU/hour (approx.)
Weight	15.8 lb (7.2 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-26 lists the power supply LEDs and their meanings.

Table A-26 3000 W AC-Input Power Supply LEDs

LED	Meaning
INPUT OK	• Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.
42V OK	• Green—42 VDC is present at the fan power connector. • Off—42 VDC is not present at the fan power connector.

3000 W Power Supply AC Power Cords

Table A-27 lists the specifications for the AC power cords that are available for the 3000 W AC-input power supply. The table includes references to power cord illustrations.

Note All 3000 W power supply power cords are 14 feet (4.3 meters) in length.

Note All 3000 W power supply power cords have an IEC60320/C19 appliance connector at one end.

Table A-27 3000 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= or CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-AC-16A-AUS=	AU20S3	16 A, 250 VAC	Figure A-46
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35
Japan, North America (nonlocking plug) 200–240 VAC operation	CAB-AC-2500W-US1=	NEMA 6-20	16 A, 250 VAC	Figure A-43
Japan, North America (locking plug) 200–240 VAC operation	CAB-AC-C6K-TWLK=	NEMA L6-20	16 A, 250 VAC	Figure A-44
Japan, North America 100–120 VAC operation[1]	CAB-7513AC=	NEMA 5-20	20 A, 125 VAC	Figure A-36
Power Distribution Unit (PDU)[2]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45

1. The 3000 W power supply operating on 110 VAC delivers 1400 W.
2. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

4000 W AC-Input and DC-Input Power Supplies

The 4000 W AC-input and DC-input power supplies, (WS-CAC-4000W-US, WS-CAC-4000W-INT, and PWR-4000-DC) are supported in the following Catalyst 6500 series switches:

- Catalyst 6506
- Catalyst 6506-E
- Catalyst 6509
- Catalyst 6509-E
- Catalyst 6509-NEB
- Catalyst 6509-NEB-A
- Catalyst 6509-V-E
- Catalyst 6513
- Catalyst 6513-E

The 4000 W AC-input and DC-input power supplies, shown in Figure A-14 and Figure A-15, share the same form factor as the 1000 W, 1300 W, 2500 W, and 3000 W power supplies.

Figure A-14 4000 W AC-Input Power Supply

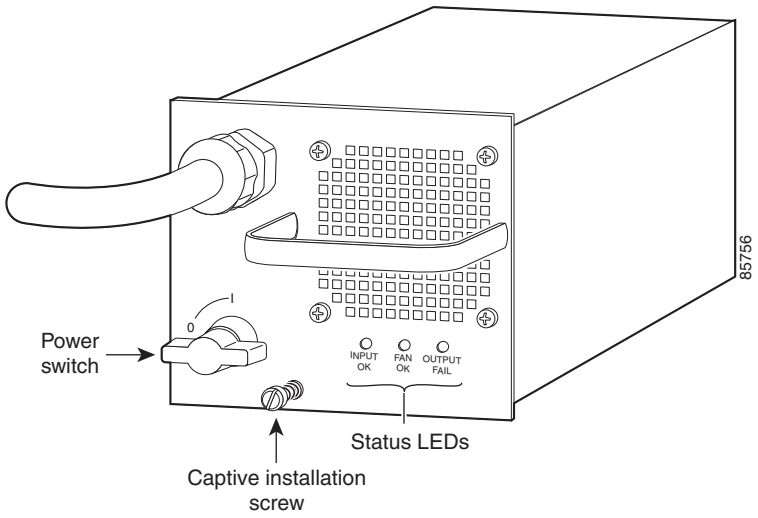
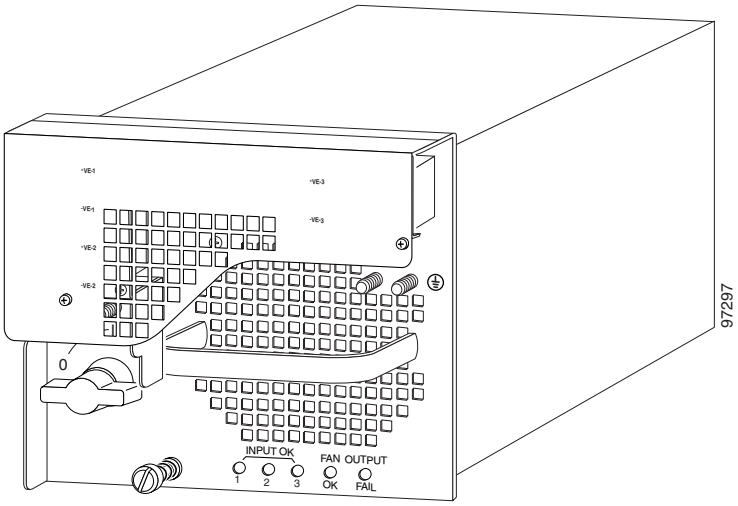


Figure A-15 4000 W DC-Input Power Supply



4000 W Power Supply Specifications

Table A-29 lists the specifications for the 4000 W AC-input power supply.

Table A-28 4000 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	High-line input with power factor correction (PFC). **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	23 A
AC-input frequency	50/60 Hz (nominal) (±3% for full range)

Table A-28 4000 W AC-Input Power Supply Specifications (continued)

Specification	Description
Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit: • For North America—30 A • For International—Circuits should be sized according to local and national codes • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.
Output capacity	4000 W maximum
Power supply output	• 15 A @ +3.3 VDC • 5 A @ +5 VDC • 10 A @ +12 VDC • 90.36 A @ +42 VDC
Output holdup time	20 ms minimum
kVA rating[1]	5.4 kVA maximum
Heat dissipation	17,065 BTU/hour (approx.)
Weight	22.2 lb (10.1 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-29 list the specification for the 4000 W DC-input power supply.

Table A-29 4000 W DC-Input Power Supply Specifications

Specification	Description
DC-input voltage	• –48 VDC @ 37 A for nominal –48 V battery backup system (operating range: –40.5 VDC to –56 VDC) • –60 VDC @ 29 A for nominal –60 V battery backup system (operating range: –55 VDC to –72 VDC) **Note** The 4000 W DC-input power supply requires two source DC-inputs to be connected; it cannot operate with only one positive (+)/negative (-) source DC terminal pair installed.
DC-input current	40 A per each DC input (three inputs) **Note** For multiple DC input power supplies, each DC input must be protected by a dedicated circuit breaker or a fuse. The circuit breaker or the fuse must be sized according to the power supply input power rating and any local or national electrical code requirements.
Power supply output capacity	• 4000 W with three inputs active • 2700 W with two inputs active **Note** The 4000 W power supply cannot operate with only one source DC-input connected.
Power supply output	• 15 A @ + 3.3 VDC • 5 A @ + 5 VDC • 12 A @ +12 VDC • 90.63 A (three inputs) or 59.68 A (two inputs) @ +42 VDC **Note** The 4000 W power supply cannot operate with only one source DC-input connected.
DC input terminal block	Accepts 4 AWG copper conductors. Actual size of the wire needed is determined by the installer or local electrician.
Output holdup time	8 ms
kVA rating[1]	5.4 kVA maximum
Heat dissipation	17,730 BTU/hour (approx.)
Weight	30.8 lb (14.0 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-30 lists the power supply LEDs and their meanings.

Table A-30 4000 W AC-Input and DC-Input Power Supplies LEDs

LED	Meaning
INPUT OK	AC-input power supplies: • Green—Source AC voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off. DC-input power supplies: • Green—Source DC voltage is OK. (Input voltage is –40.5 VDC or greater.) • Off—Source DC voltage falls below –33 VDC, is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

4000 W Power Supply AC Power Cords

Table A-31 lists the specifications for the AC power cords that are available for the 4000 W AC-input power supply. Included in the table are references to illustrations of the power cords.

Note The AC power cords for the 4000 W AC-input power supply are hardwired directly to the power supply; they do not have an IEC 60320 C19 appliance plug and cannot be removed from the power supply.

Table A-31 4000 W Power Supply AC Power Cords

Locale	Power Cord Part Number[1]	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
International	WS-CAC-4000W-INT=	IEC 60309	32 A, 250 VAC	Figure A-48
North America, Japan	WS-CAC-4000W-US=	NEMA L6-30[2]	30 A, 250 VAC	Figure A-49

1. This is the part number for the power supply. The AC power cords are hardwired to the 4000 W power supplies.
2. For Japan, ask your local electrical contractor to prepare the NEMA L6-30 power plug.

6000 W AC-Input and DC-Input Power Supplies

Catalyst 6500 series switch support for the 6000 W AC-input (WS-CAC-6000W) and the 6000 W DC-input (PWR-6000-DC) power supplies along with any power supply output restrictions are listed in Table A-32.

Table A-32 Chassis Support for the 6000 W AC-Input and DC-Input Power Supplies

Catalyst 6500 Series Chassis	6000 W AC-Input Power Supply Restriction	6000 W DC-Input Power Supply Restriction
Catalyst 6506	Output limited to 4000 W	Output limited to 4000 W
Catalyst 6506-E	No restrictions	No restrictions
Catalyst 6509	Output limited to 4000 W	Output limited to 4000 W
Catalyst 6509-E	No restrictions	No restrictions
Catalyst 6509-NEB	Output limited to 4000 W	Output limited to 4000 W
Catalyst 6509-NEB-A	Output limited to 4500 W	Output limited to 4500 W
Catalyst 6509-V-E	No restrictions	No restrictions
Catalyst 6513	No restrictions	No restrictions
Catalyst 6513-E	No restrictions	No restrictions

The 6000 W AC-input power supply, shown in Figure A-16, and the 6000 W DC-input power supply, shown in Figure A-17, share the same form factor as the 1000 W, 1300 W, 2500 W, 3000 W, and 4000 W power supplies.

Note Because of form-factor differences, the 6000 W AC-input and the 6000 W DC-input power supplies cannot be installed in the Catalyst 6503, Catalyst 6503-E, and Catalyst 6504-E switch chassis.

Figure A-16 6000 W AC-Input Power Supply

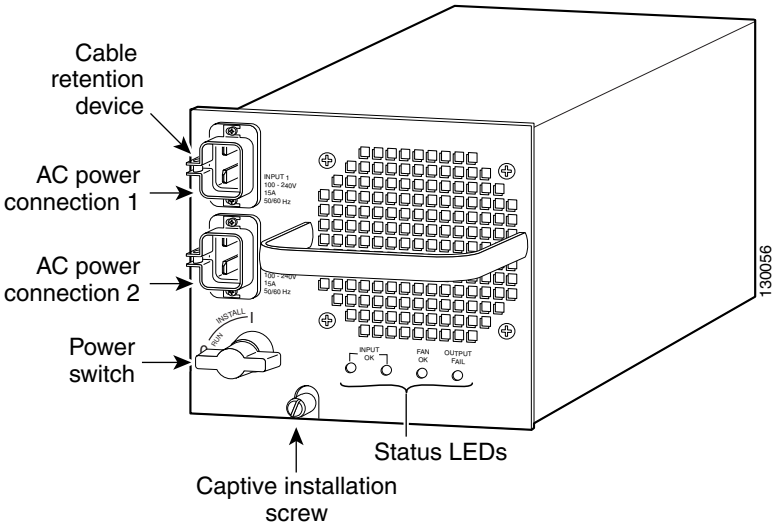
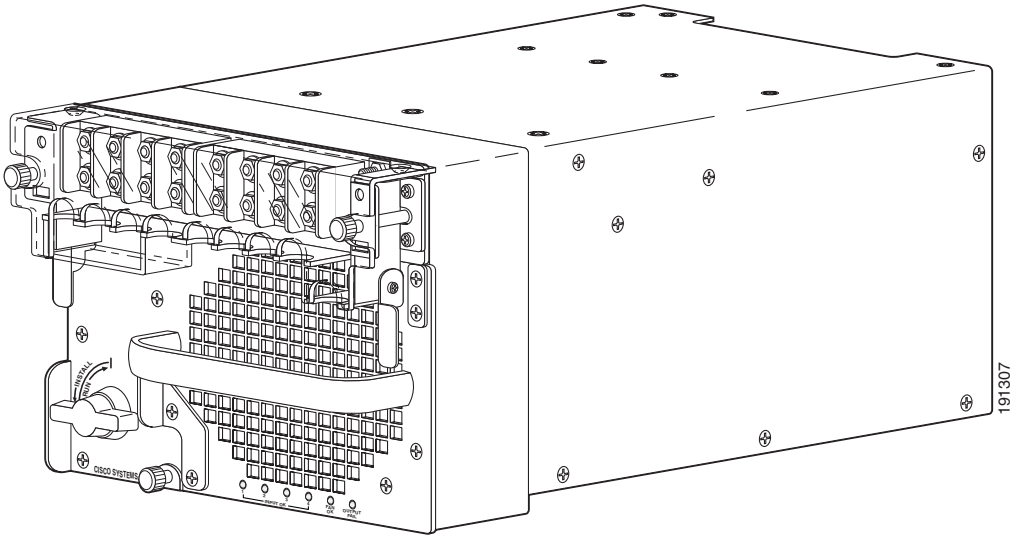


Figure A-17 6000 W DC-Input Power Supply



6000 W Power Supply Specifications

Table A-34 lists the specifications for the 6000 W AC-input power supply.

Table A-33 6000 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	2 AC-inputs per power supply. High-line input with power factor correction (PFC) included. **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)
AC-input current	16 A each input
AC-input frequency	50/60 Hz (nominal) (±3% for full range)

Table A-33 6000 W AC-Input Power Supply Specifications (continued)

Specification	Description
Branch circuit requirement	Each power supply input should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits should be sized according to local and national codes • All Catalyst 6500 series AC-input power supplies require single-phase source AC. • All AC power supply inputs are fully isolated. – Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B. – For high-line operation, the power supply operates with the hot conductor wired to a source AC phase and the neutral conductor wired either to ground or to another source AC phase as long as the net input voltage is in the range of 170 to 264 VAC. – Source AC can be out of phase between AC inputs on power supplies that are equipped with multiple AC inputs, which means that power cord 1 can be plugged into phase A and power cord 2 can be plugged into phase B.

Table A-33 6000 W AC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output capacity	The 6000 W power supply can operate at either 2900 W or 6000 W depending on the number of AC power cords attached and the source AC voltage. **Note** The 6000 W AC-input power supply is limited to 4000 W maximum output when it is installed in a Catalyst 6506, Catalyst 6509, or Catalyst 6509-NEB switch chassis. The power supply is limited to 4500 W maximum output when it is installed in the Catalyst 6509-NEB-A switch chassis. • 2900 W maximum with the following source AC arrangements: – INPUT 1 and INPUT 2 both connected to low-line (120 VAC nominal) – INPUT 1 connected to high-line (230 VAC nominal); INPUT 2 not connected – INPUT 1 not connected; INPUT 2 connected to high-line (230 VAC nominal) – INPUT 1 connected to high-line (230 VAC nominal); INPUT 2 connected to low-line (120 VAC nominal) – INPUT 1 connected to low-line (120 VAC nominal); INPUT 2 connected to high-line (230 VAC nominal) • 6000 W maximum with the following source AC arrangements: – INPUT 1 and INPUT 2 both connected to high-line (230 VAC nominal) **Note** The 6000 W power supply will not power up if you have only one power cord plugged into either INPUT 1 or INPUT 2 and source AC is low-line (120 VAC nominal).

Table A-33 6000 W AC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output capacity	• 2900 W operation (one 220 VAC source or two 110 VAC sources) – 25 A @ +3.3 VDC – 12 A @ +12 VDC – 63.6 A @ +42 VDC • 6000 W operation (two 220 VAC sources) – 25 A @ +3.3 VDC – 12 A @ +12 VDC – 137.4 A @ +42 VDC
Output holdup time	20 ms minimum
kVA rating[1]	7.5 kVA
Heat dissipation	23,812 BTU/hour (approx.)
System power dissipation	7034 W
Weight	25.4 lb (11.5 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-34 list the specifications for the 6000 W DC-input power supply.

Table A-34 6000 W DC-Input Power Supply Specifications

Specification	Description
Input voltage	• –48 VDC nominal @ 37 A in North America (operating range: –40.5 VDC to –56 VDC) • –60 VDC nominal @ 30 A for international (operating range: –55 VDC to –72 VDC)
Input current	40 A per DC input @ –48 VDC input voltage (total of 4 inputs)
Power supply output capacity	The 6000 W DC-input power supply can operate at either: • 2800 W—2 DC inputs active • 4500 W—3 DC inputs active • 6000 W—4 DC inputs active

Table A-34 6000 W DC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output	The 6000 W DC-input power supply can operate at either 2800 W, 4500 W, or 6000 W depending on the number of source DC power cables attached. **Note** The 6000 W DC-input power supply is limited to 4000 W maximum output when it is installed in a Catalyst 6506, Catalyst 6509, or Catalyst 6509-NEB switch chassis. The power supply is limited to 4500 W maximum output when it is installed in the Catalyst 6509-NEB-A switch chassis. • 2800 W operation (two DC inputs) – 25.0 A @ 3.3 VDC – 12.0 A @ 12 VDC – 61.2 A @ 42 VDC • 4500 W operation (three DC inputs) – 25.0 A @ 3.3 VDC – 12.0 A @ 12 VDC – 101.9 A @ 42 VDC • 6000 W operation (four DC inputs) – 25.0 A @ 3.3 VDC – 12.0 A @ 12 VDC – 137.4 A @ 42 VDC
DC input terminal block	• Accepts 2-hole copper compression-type lugs. **Note** The actual size of the wire needed is determined by the power engineer or local electrician in accordance with national or local electrical codes. • Terminal posts accept 1/4-inch-20 hex nuts.
Output holdup time	20 ms minimum
Weight	35 lbs (16 kg)

Table A-35 list the 6000 W AC-input and DC-input power supply LEDs and their meanings.

Table A-35 6000 W AC-Input and DC-Input Power Supply LEDs

LED	Meaning
INPUT OK 1, INPUT OK 2 (AC-input power supply only)	• Green—Source voltage is OK. Input voltage is 85 VAC or greater. • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off.
INPUT OK 1, INPUT OK 2, INPUT OK 3, and INPUT OK 4 (DC-input power supply only)	• Green—Source DC voltage is greater than or equal to –40.5 VDC. • Off—Source DC voltage is less than or equal to –37.5 VDC. • Green, off, or flashing—Source DC voltage is between –37.5 and –40.5 VDC.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—Problem with one or more of the DC-output voltages of the power supply. • Off—DC-output voltages within acceptable margins. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

6000 W Power Supply AC Power Cords

Table A-36 lists the specifications for the AC power cords that are available for the 6000 W AC-input power supply. Included in the table are references to illustrations of the power cords.

Table A-36 6000 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= or CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-AC-16A-AUS=	AU20S3	16 A, 250 VAC	Figure A-46
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35

Table A-36 6000 W Power Supply AC Power Cords (continued)

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Japan, North America (nonlocking plug) 200–240 VAC operation	CAB-AC-2500W-US1=	NEMA 6-20	16 A, 250 VAC	Figure A-43
Japan, North America (locking plug) 200–240 VAC operation	CAB-AC-C6K-TWLK=	NEMA L6-20	16 A, 250 VAC	Figure A-44
Japan, North America 100–120 VAC operation[1]	CAB-7513AC=[2]	NEMA 5-20	16 A, 125 VAC	Figure A-36
Power Distribution Unit (PDU)[3]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45

1. The 6000 W power supply operating on two 110 VAC inputs delivers 2900 W.
2. When operating with 100–120 VAC, you must use two AC power cords and the power supply output is limited to 2900 W.
3. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

8700 W AC-Input Power Supply

Catalyst 6500 series switch support for the 8700 W AC-input (WS-CAC-8700W-E) power supply along with any power supply output restrictions are listed in Table A-37.

Table A-37 Chassis Support for the 8700 W Power Supply

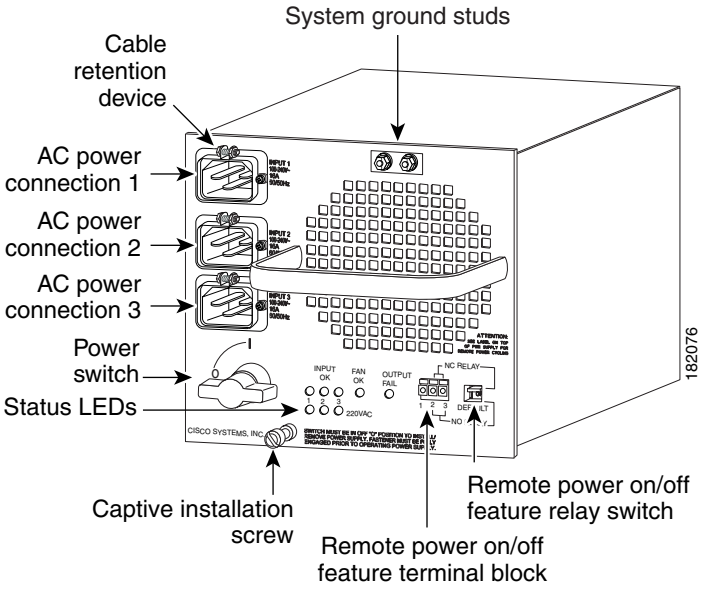
Catalyst 6500 Series Chassis	8700 W Power Supply Restriction
Catalyst 6506	Output limited to 4000 W
Catalyst 6506-E	No restrictions
Catalyst 6509	Output limited to 4000 W
Catalyst 6509-E	No restrictions
Catalyst 6509-NEB	Output limited to 4000 W
Catalyst 6509-NEB-A	Output limited to 4500 W
Catalyst 6509-V-E	No restrictions
Catalyst 6513	Output is limited to 6000 W
Catalyst 6513-E	No restrictions

The 8700 W AC-input power supply, shown in Figure A-18, shares a similar, but not identical, form-factor as the 1000 W, 1300 W, 2500 W, 3000 W, 4000 W, and 6000 W power supplies.

Note Because of the form-factor difference, when you install an 8700 W power supply in a Catalyst 6506, Catalyst 6509, or Catalyst 6509-NEB chassis you must relocate the system ground connection from the chassis ground pad connection to the two system ground studs located on the 8700 W power supply faceplate. Installing an 8700 W power supply in the other Catalyst 6500 series chassis does not require that you move the chassis system ground connection to the power supply.

The 8700 W power supply cannot be installed in the Catalyst 6503, Catalyst 6503-E, and Catalyst 6504-E switch chassis.

Figure A-18 8700 W AC-Input Power Supply



8700 W Power Supply Specifications

Table A-38 lists the specifications for the 8700 W AC-input power supply.

Table A-38 8700 W AC-Input Power Supply Specifications

Specification	Description
AC-input type	3 AC-inputs per power supply. High-line input with power factor correction (PFC) included. **Note** Power factor correction is a standard feature on all Catalyst 6500 series AC-input power supplies. PFC reduces the reactive component in the source AC current allowing higher power factors (typically 99 percent or better) and lower harmonic current components.
AC-input voltage (One-phase)	• Low-line (120 VAC nominal)—90 VAC (min) to 132 VAC (max) • High-line (230 VAC nominal)—170 VAC (min) to 264 VAC (max)

Table A-38 8700 W AC-Input Power Supply Specifications (continued)

Specification	Description
AC-input current	16 A each input
AC-input frequency	50/60 Hz (nominal) (±3% for full range)
Branch circuit requirement	Each power supply input should have its own dedicated, fused-branch circuit: • For North America—20 A • For International—Circuits should be sized according to local and national codes • All Catalyst 6500 series AC-input power supplies require single-phase source AC. • All AC power supply inputs are fully isolated. This means that source AC can be out of phase between multiple AC inputs on the same power supply or different AC power supplies that are installed in the same chassis. For the 8700 W power supply, this means that power cord 1 can be plugged into phases A-B, power cord 2 can be plugged into phases B-C, and power cord 3 can be plugged into phases C-A, A-B, or B-C.

Table A-38 8700 W AC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output capacity	The power supply output capacity is dependent on the number of AC power cords (1, 2, or 3) attached and the source AC voltage (110 VAC [low-line] or 220 VAC [high-line]) applied to the power supply inputs. The 8700 W AC-input power supply is limited to reduced wattage ratings when it is installed in the following Catalyst 6500 series chassis: • 4000 W maximum output when it is installed in a Catalyst 6506, Catalyst 6509, or Catalyst 6509-NEB switch chassis. • 4500 W maximum output when it is installed in the Catalyst 6509-NEB-A switch chassis. • 6000 W maximum output when it is installed in the Catalyst 6513 switch chassis. **Note** The power supply will not power up if you attach only one power cord and the power cord is connected to low-line (110 VAC nominal) source AC.
2800 W operation	2800 W maximum with the following combinations of power cords and source AC voltage applied to the power supply inputs: • Two AC inputs are connected to low-line (110 VAC nominal); the third AC input is not connected. • One AC input is connected to low-line (110 VAC nominal); one AC input is connected to high-line (220 VAC nominal); the third AC input is not connected. • One AC input is connected to high-line (220 VAC nominal); two AC inputs are not connected.
4200 W operation	4200 W maximum with the following combinations of power cords and source AC voltage applied to the power supply inputs: • All three AC inputs are connected to low-line (110 VAC nominal). • Two AC inputs are connected to low-line (110 VAC nominal); one AC input is connected to high-line (220 VAC nominal).
5800 W operation	5800 W maximum with the following combinations of power cords and source AC voltage applied to the power supply inputs: • Two AC inputs are connected to high-line (220 VAC nominal); the third AC input is connected to low-line (110 VAC nominal). • Two AC inputs are connected to high-line (220 VAC nominal); the third AC input is not connected.
8700 W operation	8700 W maximum with the following combinations of power cords and source AC voltage applied to the power supply inputs: • All three AC inputs are connected to high-line (220 VAC nominal).

Table A-38 8700 W AC-Input Power Supply Specifications (continued)

Specification	Description
Power supply output	• 2800 W operation – 25.0 A @ +3.3 VDC – 12.0 A @ +12 VDC – 61.29 A @ +42 VDC • 4200 W operation – 25.0 A @ +3.3 VDC – 12.0 A @ +12 VDC – 94.62 A @ +42 VDC • 5800 W operation – 25.0 A @ +3.3 VDC – 12.0 A @ +12 VDC – 132.71 A @ +42 VDC • 8700 W operation – 25.0 A @ +3.3 VDC – 12.0 A @ +12 VDC – 201.75 A @ +42 VDC
Output holdup time	20 ms minimum
kVA rating[1]	10.4 kVA
Heat dissipation	• 11,200 BTU/hour @ 2800 W • 16,800 BTU/hour @ 4200 W • 23,200 BTU/hour @ 5800 W • 34,800 BTU/hour @ 8700 W
System power dissipation	10,360 W
Weight	39.7 lb (18 kg)

1. The kVA rating listed for the power supply should be used as the sizing criteria for both UPS outputs as well as standard circuits and transformers to power a switch.

Table A-39 lists the power supply LEDs and their meanings.

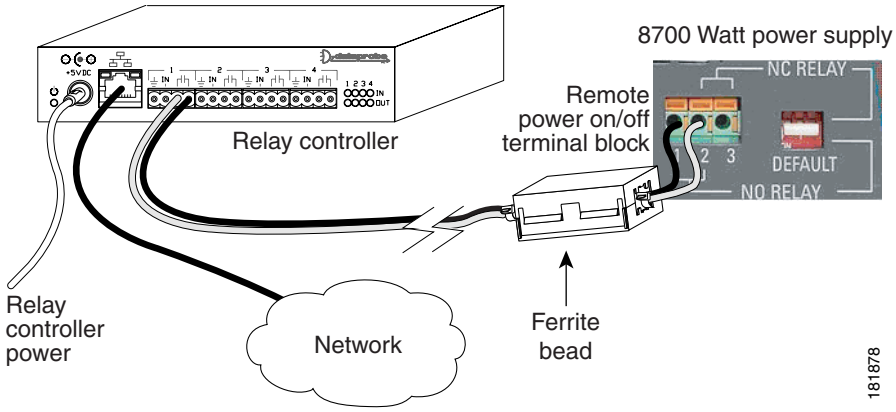
Table A-39 8700 W AC-Input Power Supply LEDs

LED	Meaning
INPUT OK 1, INPUT OK 2, and INPUT OK 3	• Green—Source voltage is OK. (Input voltage is 85 VAC or greater.) • Off—Source AC voltage falls below 70 VAC, is not present, or the power supply is turned off.
220VAC 1, 2, and 3	• Green—High-line AC is present on the respective AC inputs. (Input voltage is 170 VAC or higher.) • Off—Source AC voltage falls below 170 VAC (running at low-line voltage), is not present, or the power supply is turned off.
FAN OK	• Green—Power supply fan is operating properly. • Off—Power supply fan failure is detected.
OUTPUT FAIL	• Red—One or more of the power supply DC-output voltages is out of the normal operating range: – For +3.3 VDC output: 2.7–3.0 VDC (min); 3.6–3.8 VDC (max) – For +12 VDC output: 10.5–11.5 VDC (min); 12.6–13.0 VDC (max) – For +42 VDC output: 38.0–40.0 VDC (min); 45.0–52.0 VDC (max) • Off—All DC-output voltages are within normal operating ranges. **Note** For proper operation of the OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.

Remote Power Cycling Feature

The 8700 W power supply is equipped with a remote power cycling feature that allows you to remotely turn on or turn off the power supply through an external relay controller box. Figure A-19 shows a typical remote power on/off setup. A three-position terminal block and a switch, located on the lower right quadrant of the power supply faceplate (see Figure A-18), provide the interface to the external relay controller box.

Figure A-19 Remote Power On/Off Feature Components



Terminal Block

The terminal block has three contacts labeled 1, 2, and 3. Two control wires from an external relay controller box attach to either positions 1 and 2 or positions 2 and 3. Positions 1 and 2 are used when the relay controller box contains a normally-open (NO) type of relay. Positions 2 and 3 are used when the relay controller box contains a normally-closed (NC) type of relay.

Relay Controller Box Switch

The relay controller box switch, located next to the terminal block, allows you to match the power supply power control signal's active state with the type of relay contained in the external relay controller box (either a normally-open type of relay or a normally-closed type of relay).

Ferrite Bead

A plastic bag containing one ferrite bead and two 4-inch plastic ties is included with the 8700 W power supply AC power cords. The ferrite bead is a passive device that limits high-frequency interference on interface and control cables, and is only required when you install the remote power-cycling feature that is supported by the 8700 Watt power supply. The ferrite bead is installed on the two control wires that come from the relay controller box to the terminal block on the 8700 W power supply. The ferrite bead should be installed as close as possible to the power supply terminal block for the bead to be effective. You do not need the ferrite bead for 8700 Watt power supply installations that do not include the remote power-cycling feature. If you need to install the ferrite bead, refer to "Installing the Ferrite Bead" procedure on page 4-100.

Remote Power-Cycling Operation

This feature allows you to remotely power cycle the Catalyst 6500 series switch using any appropriate third-party relay controller. This eliminates the need for you to have access to the supervisor engine console or CLI to control power cycling. Table A-40 lists the relay controller box relay type, the corresponding power supply terminal block positions, and a description of the power-cycling operation.

Table A-40 8700 W Power Supply Relay Controller Switch Settings and Operation

External Relay Controller Box Relay Type	Power Supply Relay Controller Switch Setting	Power Supply Terminal Block Positions Used	Remote Power-Cycling Operation
Normally open (NO) relay.	NO RELAY (DEFAULT)	Control wires from the external relay controller box attach to terminal block positions 1 and 2.	• Power supply cycled from on to off—The power supply is powered off by energizing the relay (relay contacts go from open to closed) for more than 30 seconds. • Power supply cycled from off to on—The power supply is powered on by deenergizing the relay (relay contacts go from closed to open) for more than 10 seconds.
Normally closed (NC) relay.	NC RELAY	Control wires from the external relay controller box attach to terminal block positions 2 and 3.	• Power supply cycles from on to off—The power supply is powered off by energizing the relay (relay contacts go from closed to open) for more than 30 seconds. • Power supply cycles from off to on— The power supply is powered on by deenergizing the relay (relay contacts go from open to closed) for more than 10 seconds.
No relay attached. Remote power-cycling feature not installed.	NO RELAY (DEFAULT)	—	—

8700 W Power Supply AC Power Cords

Table A-41 lists the specifications for the AC power cords that are available for the 8700 W AC-input power supply. Included in the table are references to illustrations of the power cords.

Table A-41 8700 W Power Supply AC Power Cords

Locale	Power Cord Part Number	AC Source Plug Type	Cordset Rating	Power Cord Reference Illustration
Argentina	CAB-7513ACR= or CAB-IR2073-C19-AR=	IRAM 2073	16 A, 250 VAC	Figure A-31
Australia, New Zealand	CAB-AC-16A-AUS=	AU20S3	16 A, 250 VAC	Figure A-46
People's Republic of China	CAB-AC16A-CH=	GB16C	16 A, 250 VAC	Figure A-37
Continental Europe	CAB-AC-2500W-EU=	CEE 7/7	16 A, 250 VAC	Figure A-41
International	CAB-AC-2500W-INT=	IEC 309	16 A, 250 VAC	Figure A-42
Israel	CAB-AC-2500W-ISRL=	SI16S3	16 A, 250 VAC	Figure A-34
Italy	CAB-7513ACI=	CEI 23-16/7	16 A, 250 VAC	Figure A-35
Japan, North America (nonlocking plug) 200–240 VAC operation	CAB-AC-2500W-US1=	NEMA 6-20	16 A, 250 VAC	Figure A-43
Japan, North America (locking plug) 200–240 VAC operation	CAB-AC-C6K-TWLK=	NEMA L6-20	16 A, 250 VAC	Figure A-44
Japan, North America 100–120 VAC operation	CAB-7513AC=[1]	NEMA 5-20	16 A, 125 VAC	Figure A-36
Power Distribution Unit (PDU[2]	CAB-C19-CBN=	IEC 60320 C19 IEC 60320 C20	16 A, 250 VAC	Figure A-47
Switzerland	CAB-ACS-16=	SEV 5934-2 Type 23	16 A, 250 VAC	Figure A-45

1. When operating with 100–120 VAC, you must use two or three AC power cords and the power supply output is limited to either 2800 W (2 inputs) or 4200 W (3 inputs).
2. The PDU power cable is designed for users who power their switch from a PDU. The end of the cable that plugs into the chassis power supply has a C19 connector; the other end of the cable that connects to the PDU has a C20 connector.

AC Power Cord Illustrations

This section contains the AC power cord illustrations (see Figures A-19 through A-48). An AC power cord may be used with several power supplies. See the power supply specifications tables for the AC power cord illustrations that are applicable for your power supply.

Figure A-20 CAB-AC10A-90L-AU= (Australia and New Zealand)

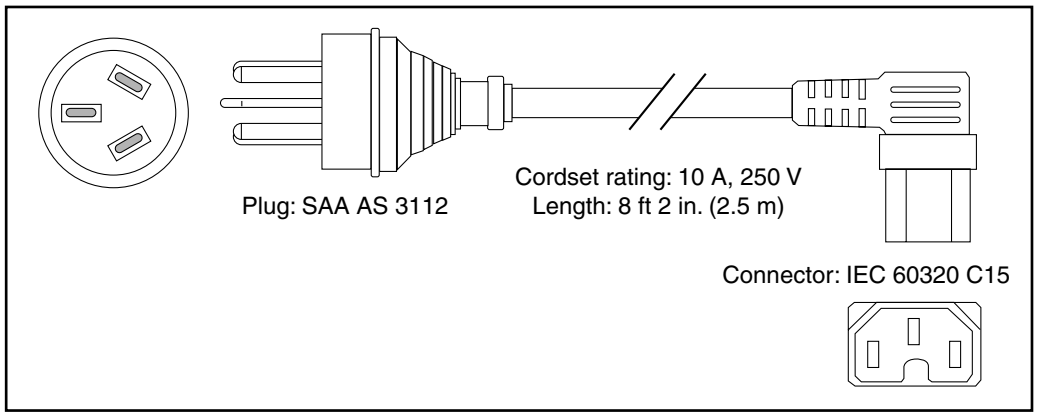


Figure A-21 CAB-AC10A-90L-EU= (Continental Europe)

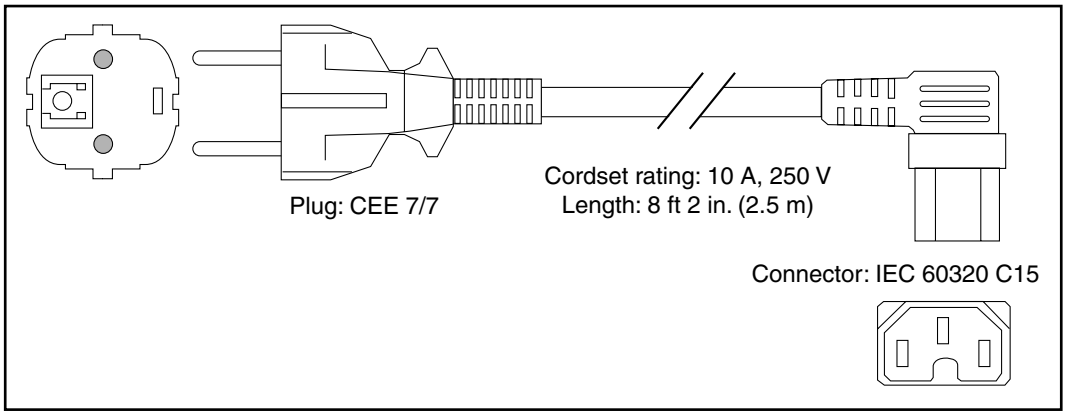


Figure A-22 CAB-AC10A-90L-IT= (Italy)

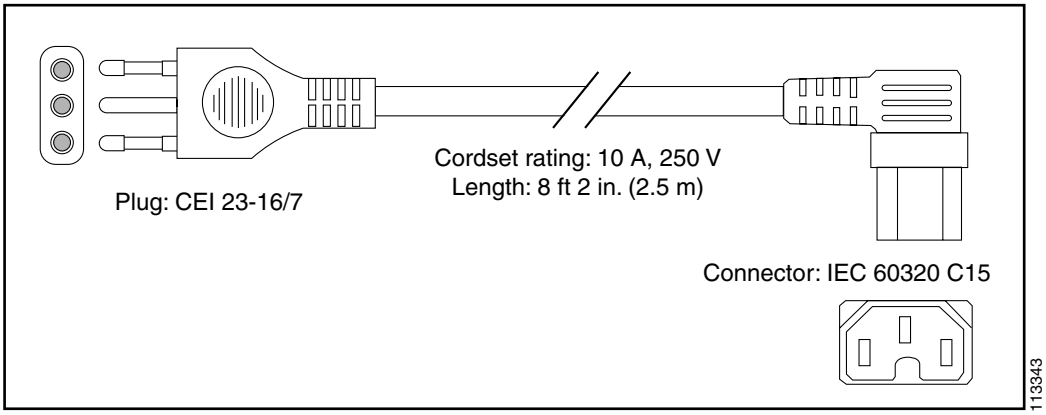


Figure A-23 CAB-AC15A-90L-US= (Japan and United States)

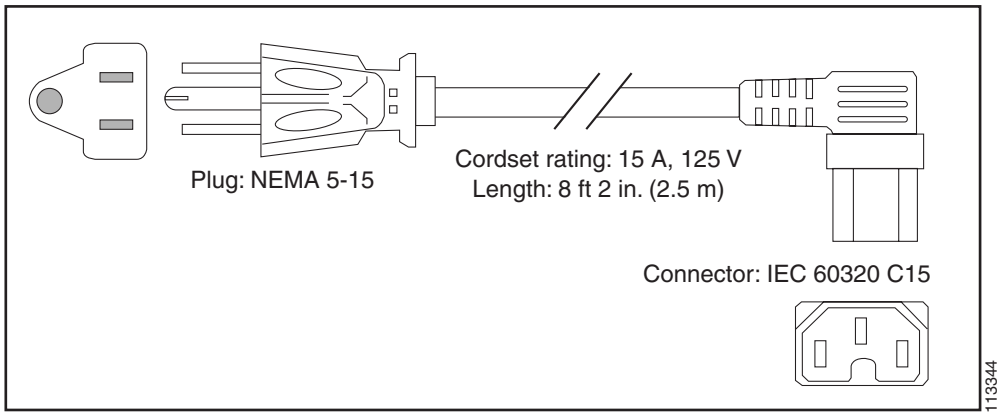


Figure A-24 CAB-AC10A-90L-UK= (United Kingdom)

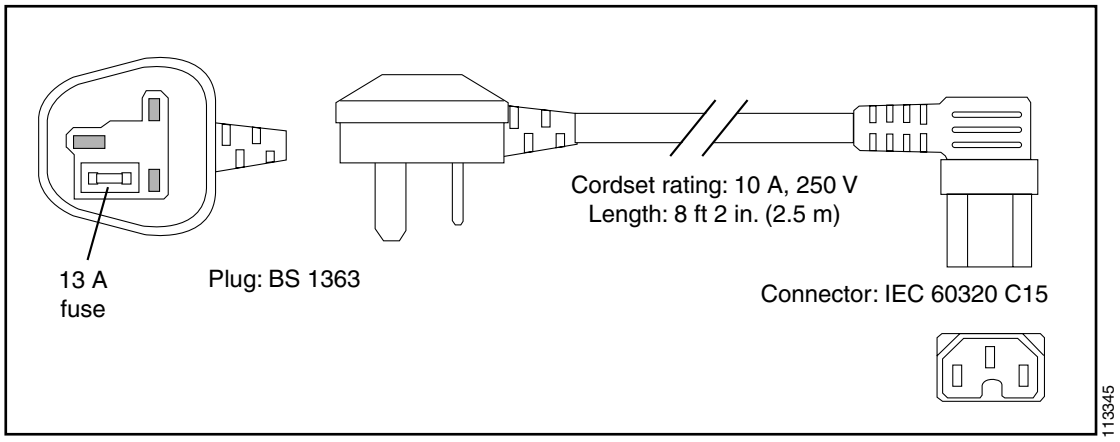


Figure A-25 CAB-7KACR= (Argentina)

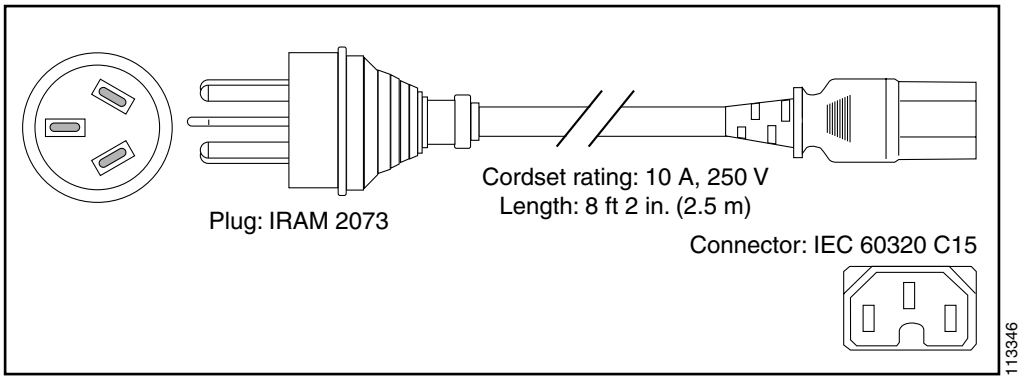


Figure A-26 CAB-7KACA= (Australia and New Zealand)

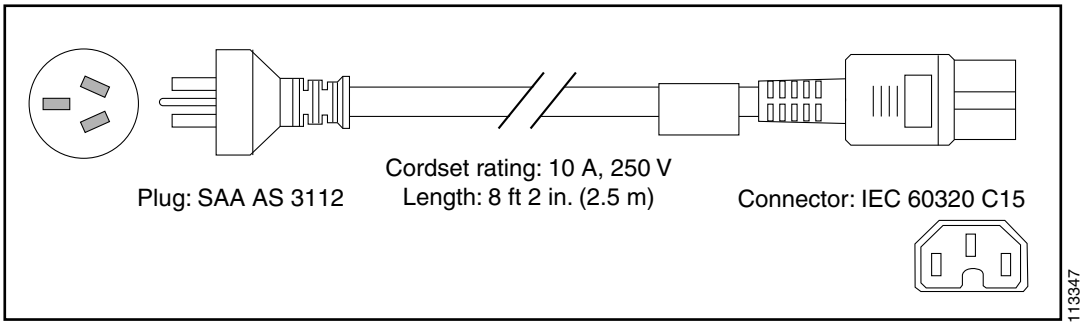


Figure A-27 CAB-7KACE= (Continental Europe)

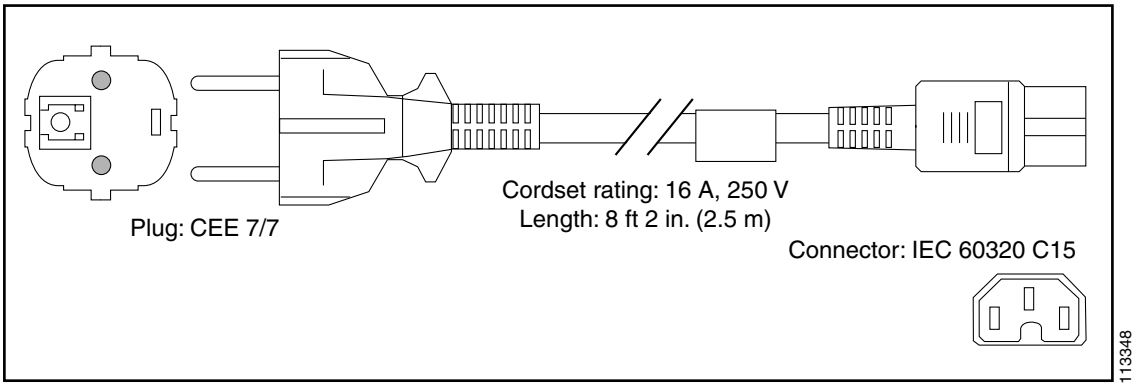


Figure A-28 CAB-7KACI= (Italy)

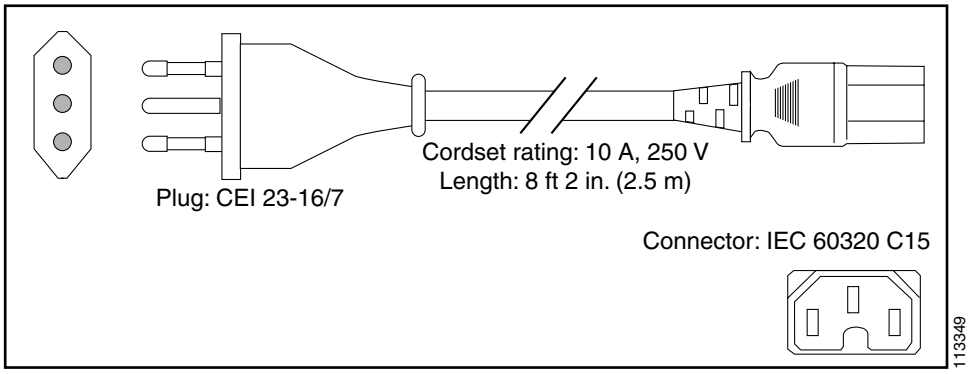


Figure A-29 CAB-7KAC-15= (Japan and United States)

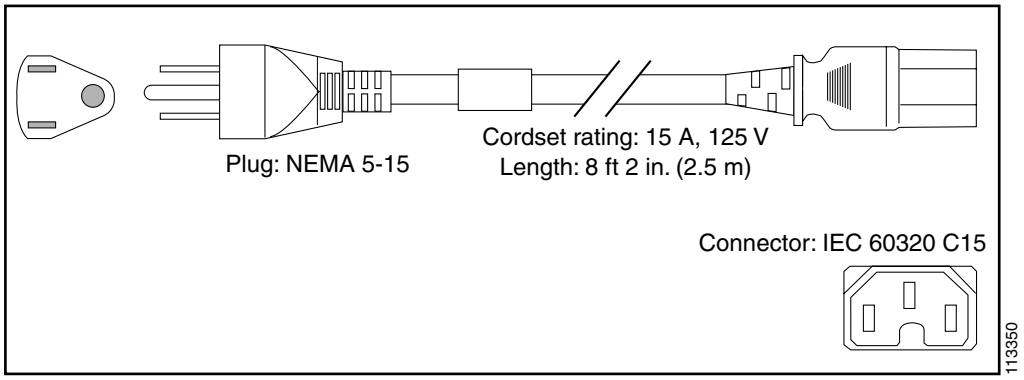


Figure A-30 CAB-7KACU= (United Kingdom)

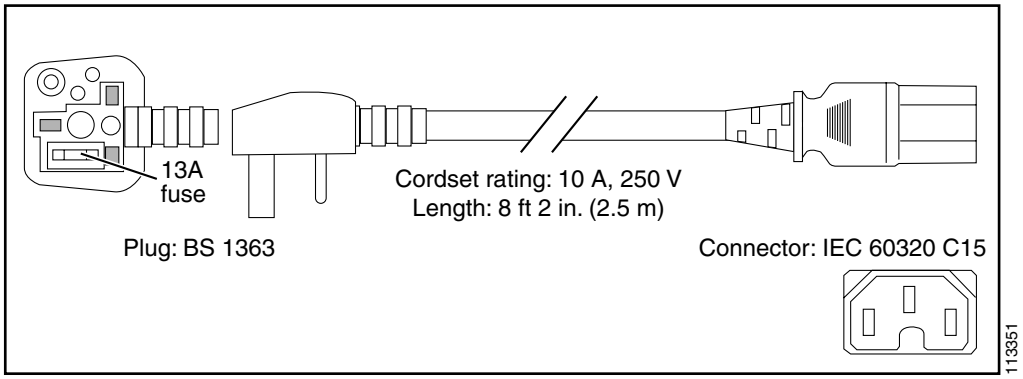


Figure A-31 CAB-7513ACR= and CAB-IR2073-C19-AR= (Argentina)

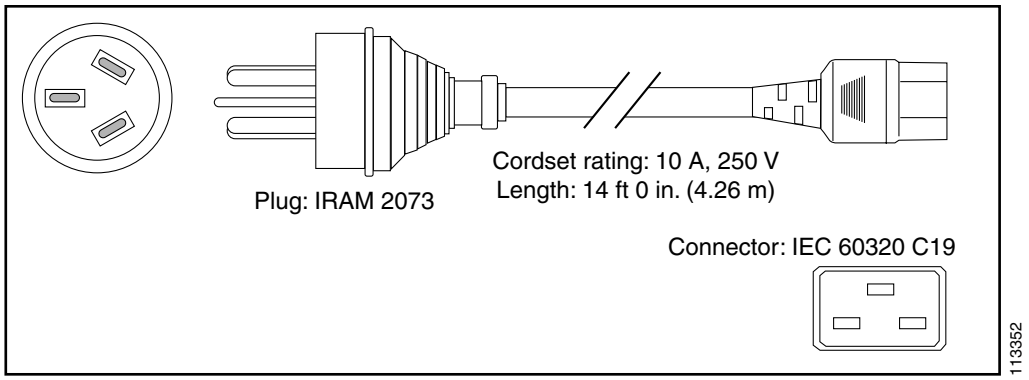


Figure A-32 CAB-7513ACA= (Australia and New Zealand)

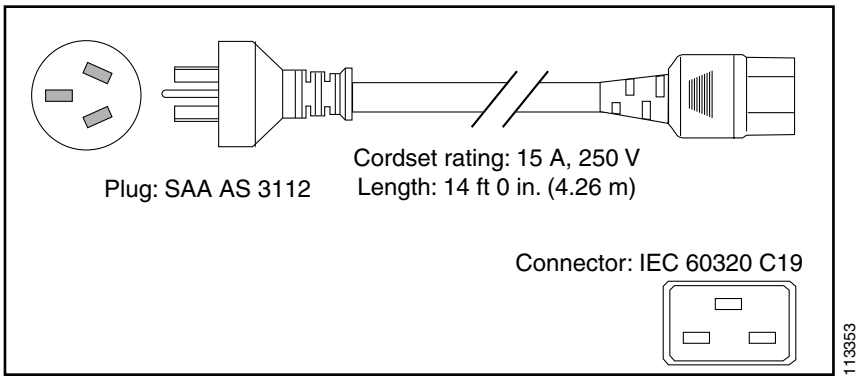


Figure A-33 CAB-7513ACE= (Continental Europe)

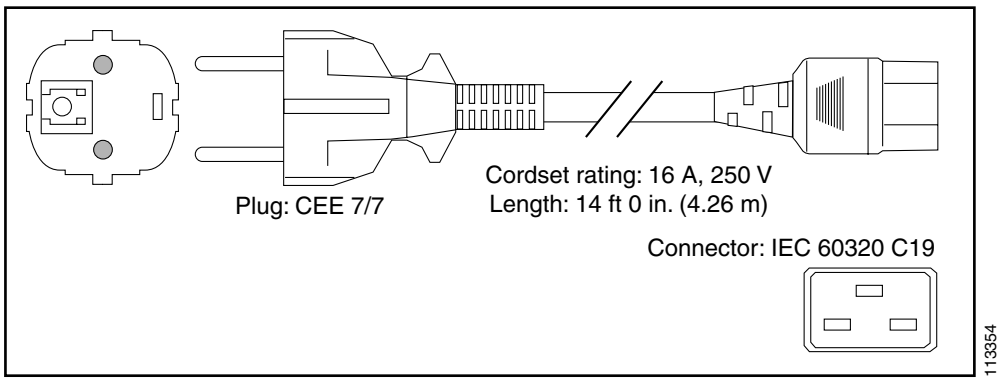


Figure A-34 CAB-AC-2500W-ISRL (Israel)

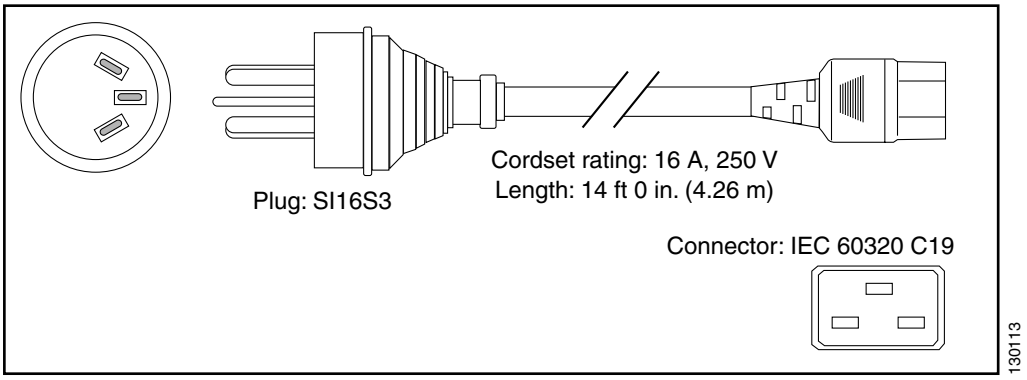


Figure A-35 CAB-7513ACI= (Italy)

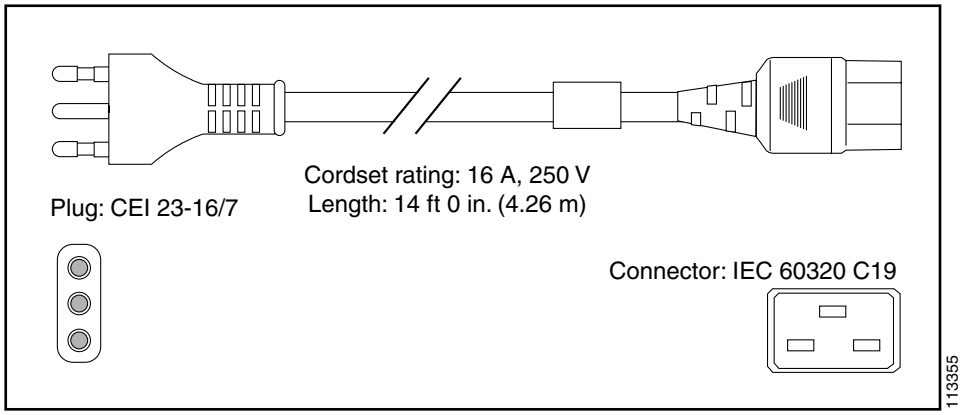


Figure A-36 CAB-7513AC= (Japan and United States)

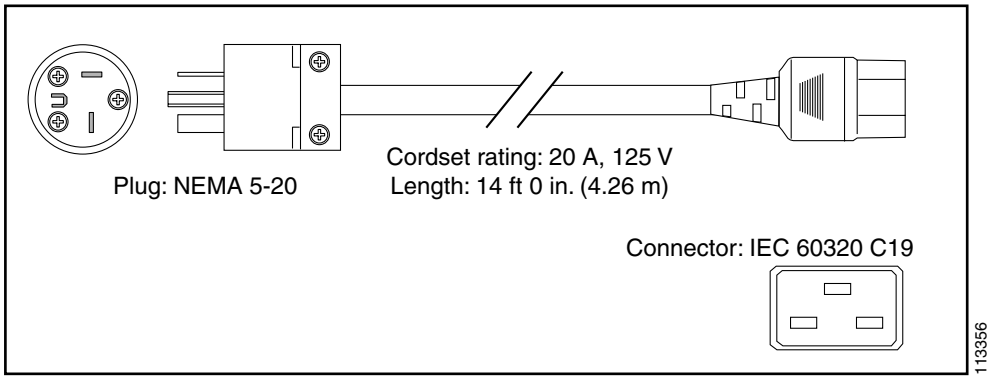


Figure A-37 CAB-AC16A-CH= (People's Republic of China)

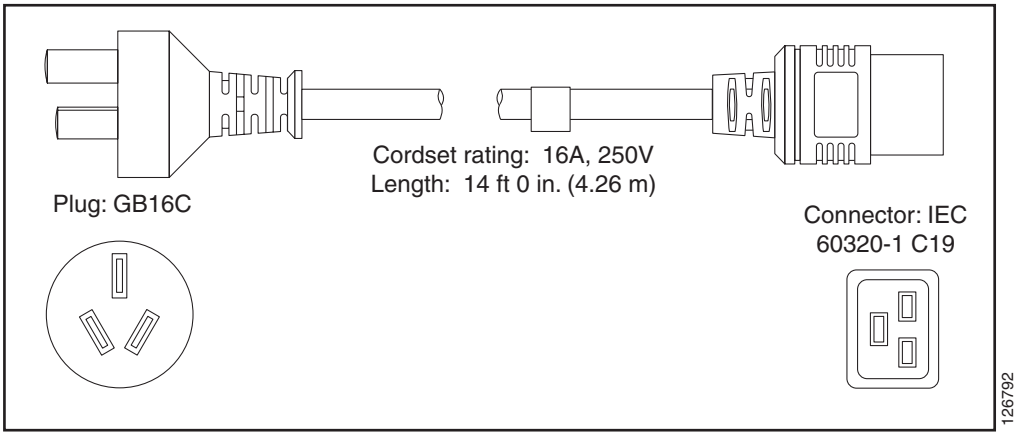


Figure A-38 CAB-7513ACSA= (South Africa)

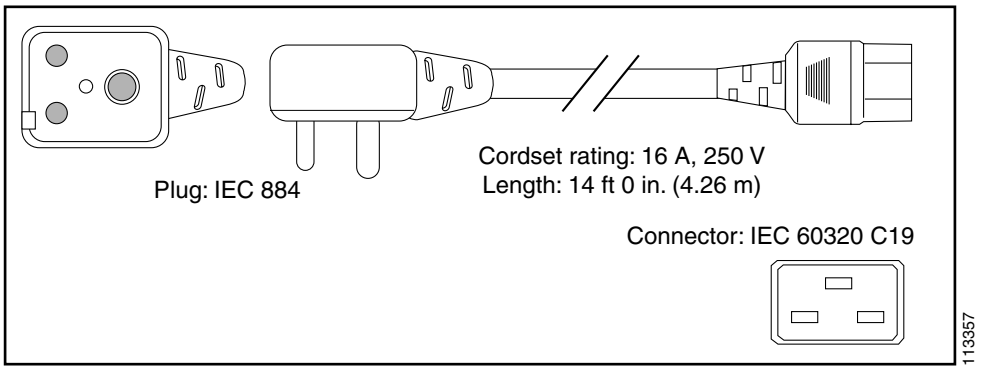


Figure A-39 CAB-ACS-10= (Switzerland)

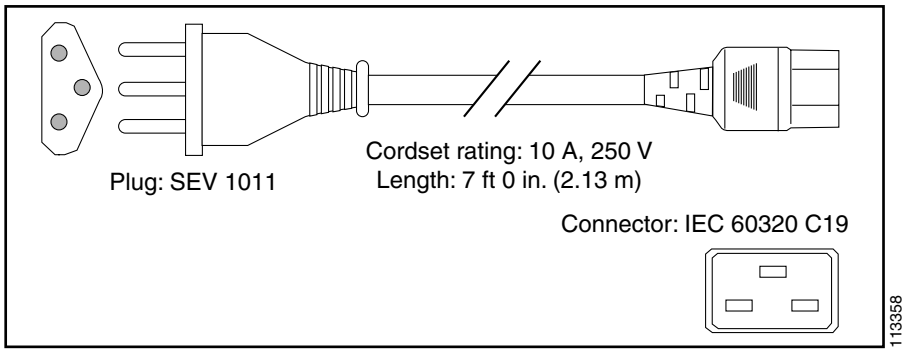


Figure A-40 CAB-7513ACU (United Kingdom)

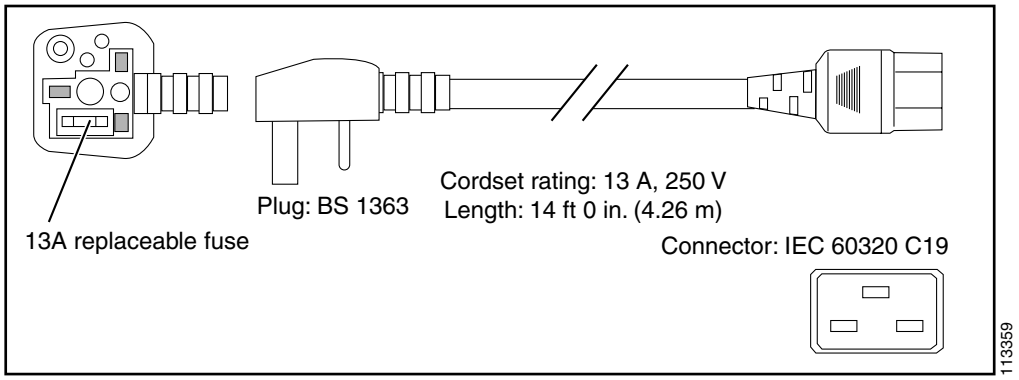


Figure A-41 CAB-AC-2500W-EU (Continental Europe)

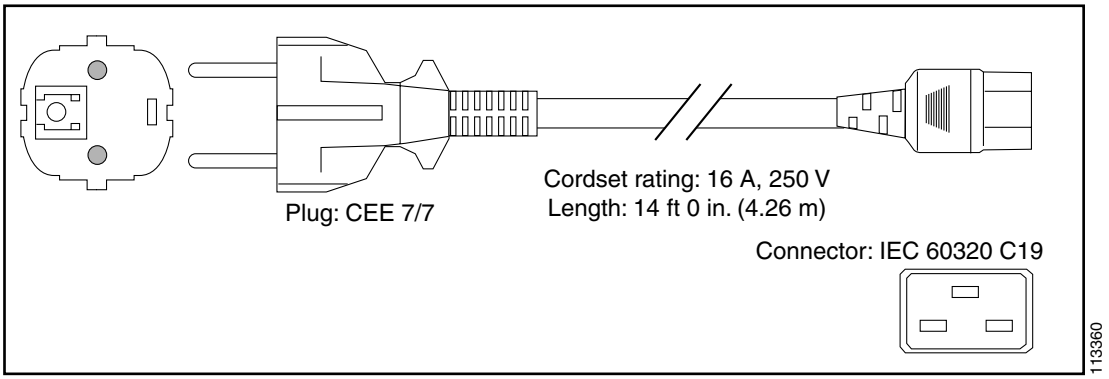


Figure A-42 CAB-AC-2500W-INT= (International)

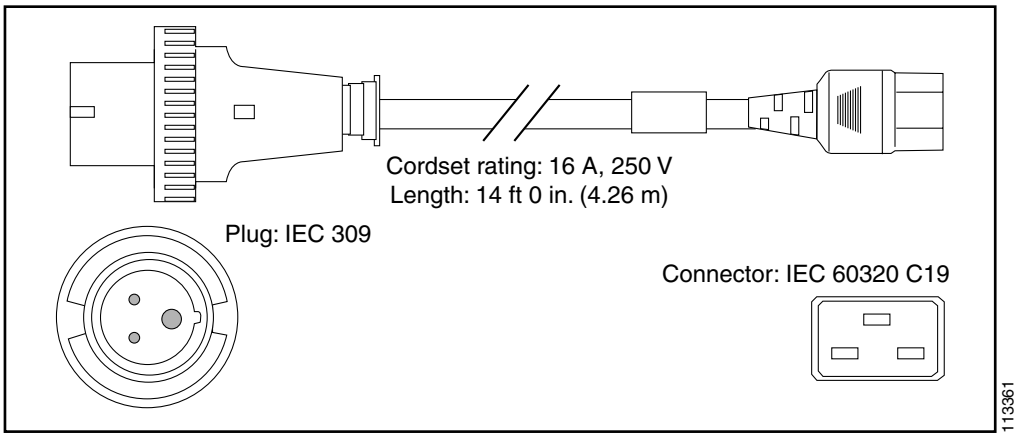


Figure A-43 CAB-AC-2500W-US1= (Japan and United States)

Figure A-44 CAB-AC-C6K-TWLK= (Japan and United States)

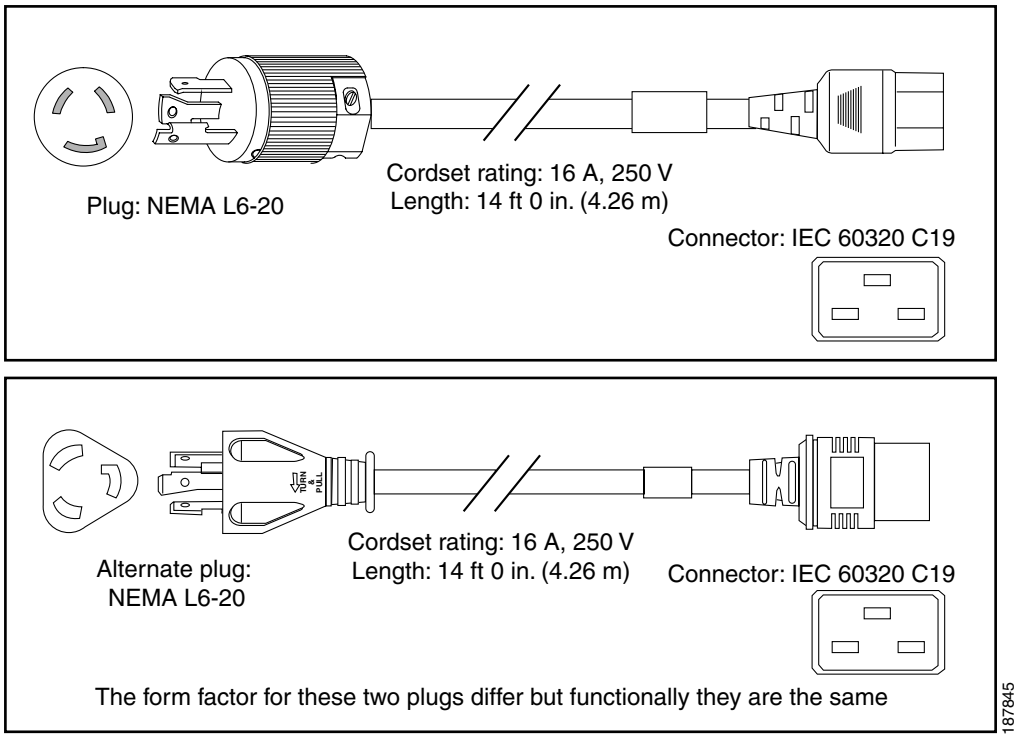


Figure A-45 CAB-ACS-16= (Switzerland)

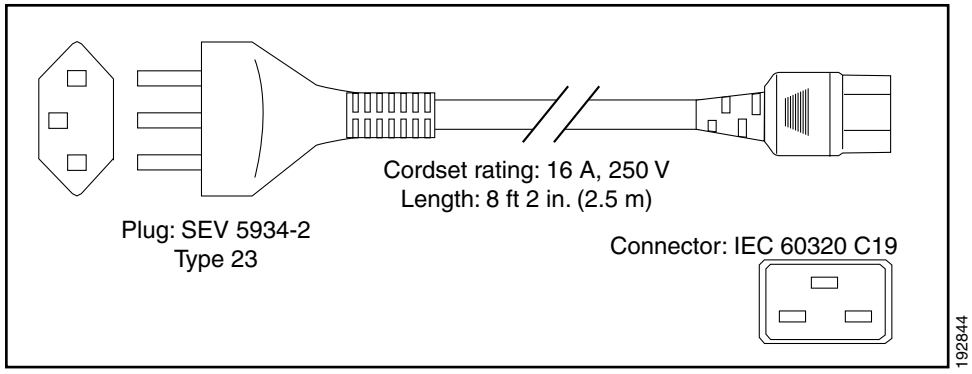


Figure A-46 CAB-AC-16A-AUS= (Australia and New Zealand)

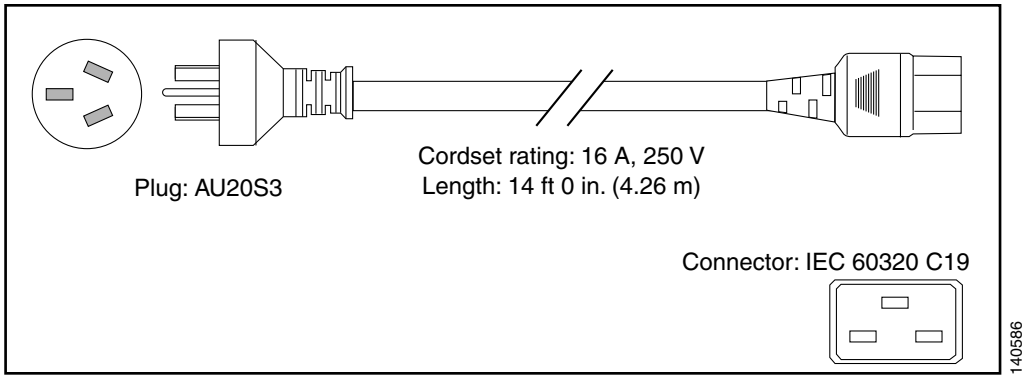


Figure A-47 CAB-C19-CBN= (PDU)

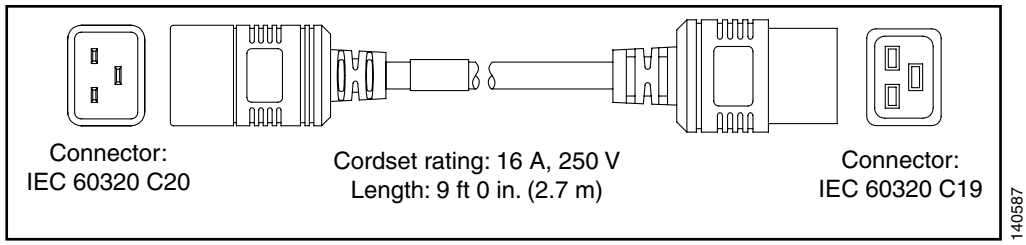


Figure A-48 WS-CAC-4000W-INT= (International)

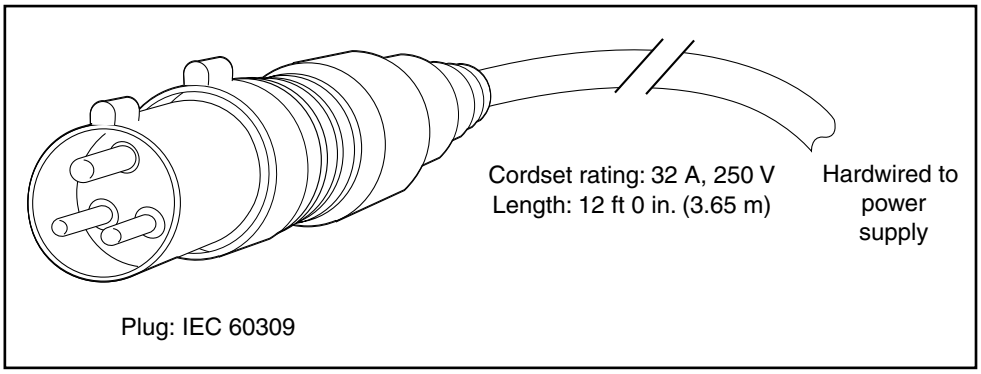
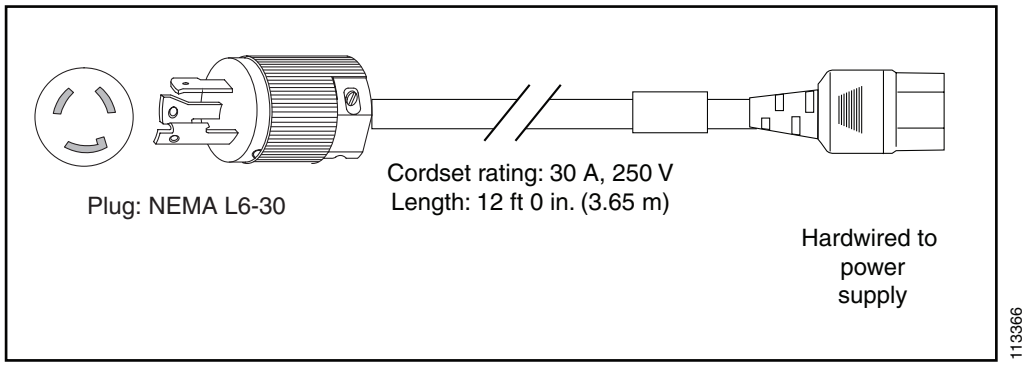


Figure A-49 WS-CAC-4000W-US= (United States)



Power Supply Redundancy

Catalyst 6500 series switching modules have different power requirements. Depending upon the wattage of the power supply, certain switch configurations might require more power than a single power supply can provide. Although the power management feature allows you to supply power to all installed modules with two power supplies, redundancy is not supported in this configuration. Redundant and combined power configurations are summarized in Table A-42. The effects of changing the power supply configurations are summarized in Table A-43.

Note For proper load-sharing operation in a redundant power supply configuration, you must install two modules in the chassis. If you fail to install two modules, you might receive spurious OUTPUT FAIL indications on the power supply.

Note In systems that have two different sized power supplies installed, you may not have true redundancy. If the larger wattage power supply fails, the smaller wattage power supply might not be able to handle the entire load by itself.

Table A-42 Power Supply Redundancy

If you have two power supplies of	and redundancy is	Then
Equal wattage	Enabled	The total power drawn from both supplies is never greater than the capability of one supply. If one supply malfunctions, the other supply can take over the entire system load. Each power supply provides approximately half of the required power to the system. Load sharing and redundancy are enabled automatically; no software configuration is required.
Unequal wattage	Enabled	Both power supplies initially come online. For the Catalyst operating system, if the difference between the two power supply's output wattage is less than 10 percent of the higher output wattage power supply, redundancy is enabled. If the difference is greater than 10 percent, the lesser wattage power supply is disabled. For Cisco IOS, both power supplies come on. The total available wattage is the output wattage of the higher wattage power supply.
Equal or unequal wattage	Disabled	The total power available to the system is approximately 167 percent of the lower-wattage power supply. The system powers up as many modules as the combined capacity allows. If the higher-wattage power supply fails, the lower-wattage supply might also shut down due to overcurrent protection to prevent damage to the lower-wattage power supply.

Table A-43 Effects of Power Supply Configuration Changes

Configuration Change	Effect
Redundant to combined	• System log and syslog messages are generated. • System power is increased to approximately 167 percent of the lower-wattage power supply. • The modules marked as *power-deny* in the **show module** Status field are powered up if there is sufficient power.
Combined to redundant	• System log and syslog messages are generated. • System power is the power capability of the higher-wattage supply. • If there is not enough power for all previously powered-up modules, some modules are powered down and marked as *power-deny* in the **show module** Status field.
Equal wattage power supply is inserted with redundancy enabled	• System log and syslog messages are generated. • System power equals the power capability of one supply. (Both supplies provide approximately one half of the total current.) • No change in the module status because the power capability is unchanged.

Table A-43 Effects of Power Supply Configuration Changes (continued)

Configuration Change	Effect
Equal wattage power supply is inserted with redundancy disabled	• System log and syslog messages are generated. • System power is the combined power capability of both supplies. • The modules marked as *power-deny* in the **show module** Status field are brought up if there is sufficient power.
Higher wattage power supply is inserted with redundancy enabled	• System log and syslog messages are generated. • The system disables the lower-wattage power supply; the higher-wattage supply powers the system (Catalyst operating system). • For Cisco IOS, both power supplies come on. The total available wattage is the output wattage of the higher wattage power supply.
Lower wattage power supply is inserted with redundancy enabled	• System log and syslog messages are generated. • The system disables the lower-wattage power supply; the higher-wattage supply powers the system (Catalyst operating system). • For Cisco IOS, both power supplies come on. The total available wattage is the output wattage of the higher wattage power supply.
Higher or lower wattage power supply is inserted with redundancy disabled	• System log and syslog messages are generated. • System power is increased to the combined power capability of both supplies. • The modules marked as *power-deny* in the **show module** Status field are brought up if there is sufficient power.
Power supply is removed with redundancy enabled	• System log and syslog messages are generated. • If the power supplies are of equal wattage, there is no change in the module status because the power capability is unchanged. If the power supplies are of unequal wattage and the lower-wattage supply is removed, there is no change in the module status. If the power supplies are of unequal wattage and the higher-wattage supply is removed, the lower-wattage power supply must be turned on manually. (The system had previously turned off the lower-wattage power supply.)
Power supply is removed with redundancy disabled	• System log and syslog messages are generated. • System power is decreased to the power capability of one supply. • If there is not enough power for all previously powered-up modules, some modules are powered down and marked as *power-deny* in the **show module** Status field.

Table A-43 Effects of Power Supply Configuration Changes (continued)

Configuration Change	Effect
System is booted with power supplies of different wattage installed and redundancy enabled	• System log and syslog messages are generated. • The lower-wattage supply is disabled (Catalyst operating system). • For Cisco IOS, both power supplies come on. The total available wattage is the output wattage of the higher wattage power supply.
System is booted with power supplies of equal or different wattage installed and redundancy disabled	• System log and syslog messages are generated. • System power equals the combined power capability of both supplies. • The system powers up as many modules as the combined capacity allows.

When running redundant 4000 W, 6000 W, or 8700 W power supplies in Catalyst 6506 and Catalyst 6509 non-E series systems, if you remove the power supply in bay 1, the total system power will be reduced to 2940 W (70 A at 42 VDC) after 180 seconds (3 minutes). You can avoid this reduction in the total system power by leaving the power supply in bay 1, even in a powered down state.

If the total system power usage is greater than 2940 W, the following scenario will apply if a 4000 W, 6000 W, or a 8700 W power supply is removed from bay 1 (these scenarios are specific to only these three power supplies running in redundant mode in either the Catalyst 6506 or Catalyst 6509 non-E series systems).

- If the power supplies in bay 1 and bay 2 are running in redundant mode, the total system power will be 4000 W.
- If power supply 1 is running and you power off or remove power supply 2, the total system power will be 4000 W. The system will issue a normal power supply 2 down/remove indication warning.
- If you power down power supply 1 while power supply 2 is operating, the system will issue a normal power supply 1 down indication warning with another warning asking the user not to remove power supply 1. If power supply 1 is left in the system, even if it is powered off, the total system power will be 4000 W.
- If you remove power supply 1 from the system, a major alarm will be issued to warn that the total system power will be reduced to 2940 W and that any modules or PoE devices that cause the system to exceed 2940 W will power down in 180 seconds (3 minutes). If you insert a replacement power supply 1 in the 180-second timeframe, no action will be taken.

Note In systems that are equipped with two power supplies, if one power supply fails and the other power supply cannot fully power all of the installed modules, system power management will shut down devices in the following order:

- Power over Ethernet (PoE) devices— The system will power down PoE devices in descending order, starting with the highest numbered port on the module in the highest numbered slot.
- Modules—If additional power savings are needed, the system will power down modules in descending order, starting with the highest numbered slot. Slots containing supervisor engines or Switch Fabric Modules are bypassed and are not powered down.

This shut down order is fixed and cannot be changed.

You can change the configuration of the power supplies to redundant or combined at any time. If you switch from a redundant to a combined configuration, both power supplies are enabled (even a power supply that was disabled because it was of a lower wattage than the other power supply). If you change from a combined to a redundant configuration, both power supplies are initially enabled, and if they are of the same wattage, they remain enabled. If they are of different wattage, a syslog message displays and the lower wattage supply is disabled.

For additional information about the power management feature and individual module power consumption, refer to your software configuration guide.