



*AC Power Supply*

*Video Multiprocessing Gateway, 14-slot  
VMG-14*

*Installation and Setup Guide*

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VMG-14 AC Power Supply Installation & Setup Guide document history

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250-0050-01 Rev A	VMG-14-ACPWRSPPLY-2PEM VMG-14-2ACPWRSPPLY-2PEM	07/12/2010	Production release.

## Document Conventions

[Table A](#) provides an easy way to recognize important information in the text.

Table A. Document conventions

When you see:	It means:
	<b>Note:</b> Indicated by the icon shown at left, this points out information that may not be part of the text but provide tips and other helpful advice.
	<b>Caution:</b> Indicated by the icon on the left, this provides an alert to an action that may have undesirable consequences if the instructions are not followed correctly. Cautions also indicate that failure to follow guidelines could cause damage to equipment or loss of data.
	<b>Warning!</b> Indicated by the icon on the left, shows that failure to take the necessary precautions or to follow guidelines could cause harm to equipment and personnel.

Clicking any blue link takes you to the item to which the link refers.

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# *Installation*

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RGB Networks has partnered with Cherokee International to deliver an AC to DC power distribution solution for cable operators wishing to connect the 14-slot Video Multiprocessing Gateway (VMG-14) to an AC power source.

This guide provides two solutions for installing and connecting the AC power supply to the VMG-14 chassis in a standard 19-inch rack:

1. Power Entry Module (PEM) redundancy with one AC power supply chassis and one circuit breaker (Figure 1).
2. Full redundancy with dual PEMs, dual AC power supply chassis, and one circuit breaker (Figure 2).

## **In This Chapter:**

- “Site Preparation,” next.
- “Warnings” on page 6.
- “Unpacking” on page 6.
- “PEM Redundancy Installation” on page 7.
- “Full Redundancy Installation” on page 19.

Figure 1 shows a diagram of the PEM redundancy solution.

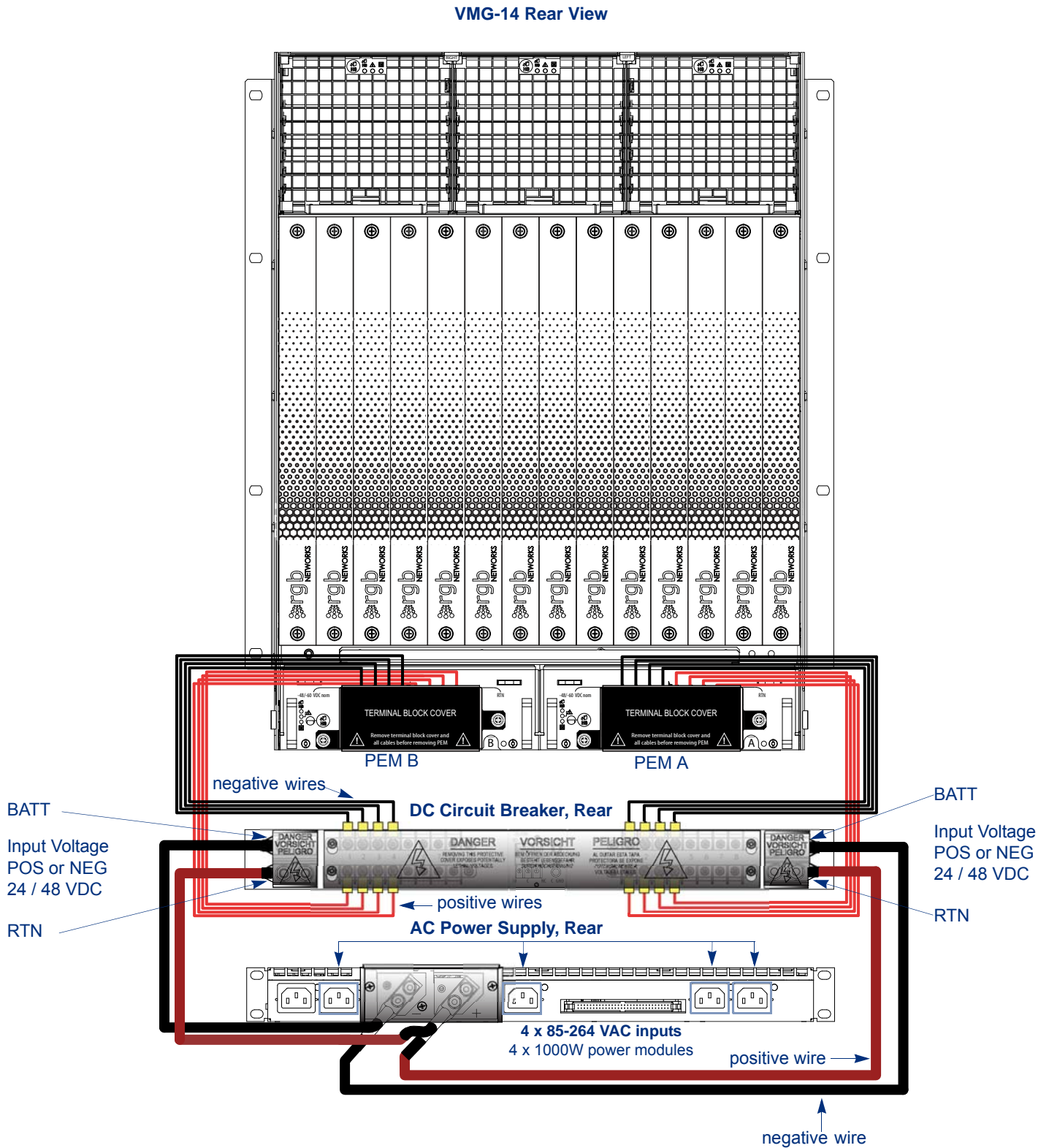


Figure 1. VMG-14 with AC Power Supply - PEM Redundancy

Figure 2 shows a diagram of the Full redundancy solution.

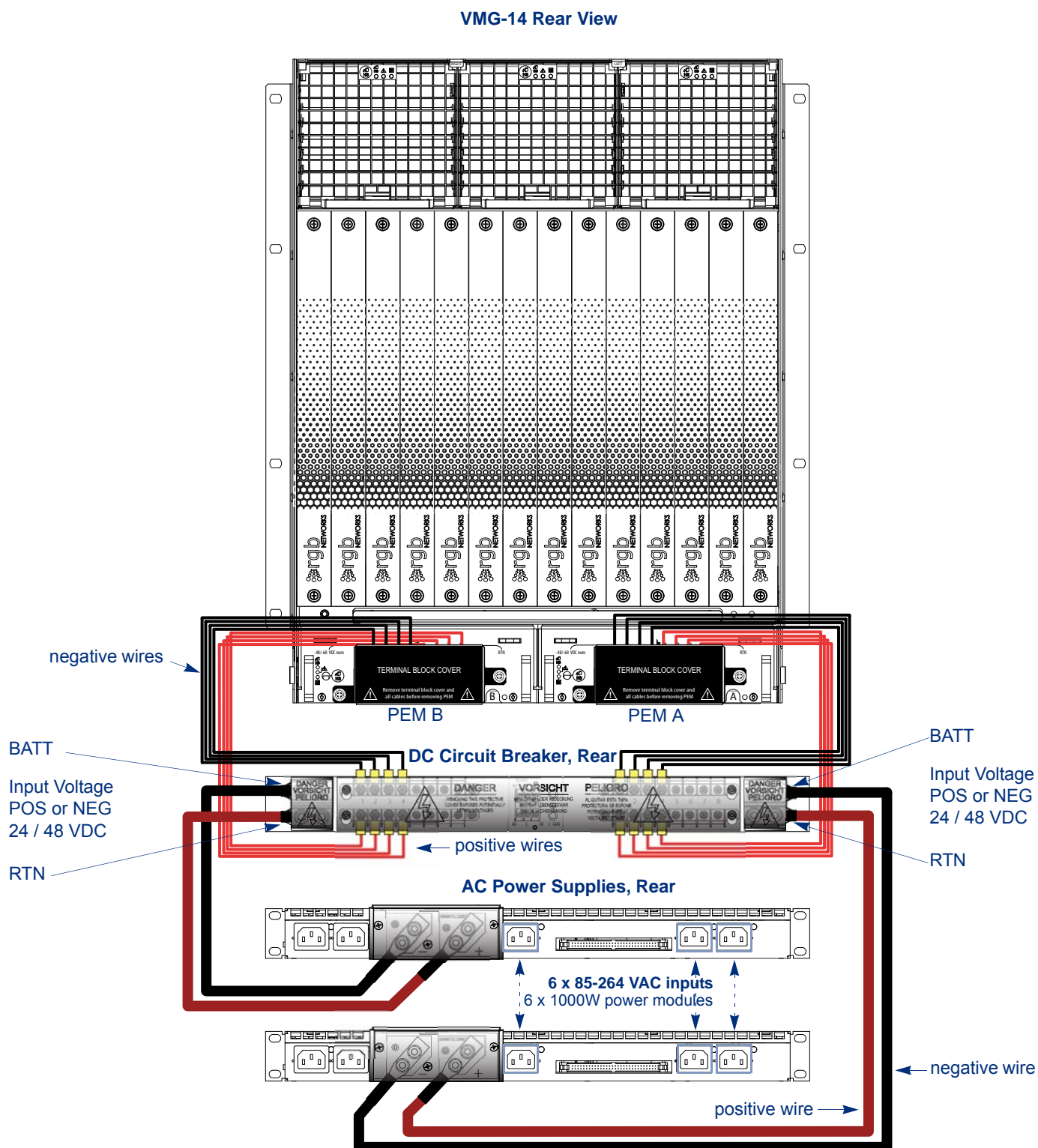


Figure 2. VMG-14 with AC Power Supplies - Full Redundancy

## Site Preparation

Be sure that you have the required items listed below before you begin installation of each AC power supply.

### Included in Packaging

Confirm that the following items have been included in the AC power supply packaging:

#### For PEM Redundancy

- One Cherokee AC Power Supply mating rack, which includes:
  - Four (4) Cherokee AC power modules of 1000W each, pre-installed in the mating rack;
  - Four (4) AC power cables;
- Two (2) sets of #4 AWG DC wires with flat and 45°-angle lugs; four (4) wires total.
- Eight (8) sets of #10 AWG DC wires with ring terminals; sixteen (16) wires total.

#### For Full Redundancy

- Two (2) Cherokee AC Power Supply mating racks, each of which include:
  - Three (3) Cherokee AC power modules of 1000W each, pre-installed in the mating rack; six (6) modules total;
  - Three (3) AC power cables; six (6) cables total.
- Two (2) sets of #4 AWG DC wires with lugs; four (4) wires total.
- Eight (8) sets of #10 AWG DC wires with ring terminals; sixteen (16) wires total.

### Required Tools / Accessories

The following items have not been included in your shipment and will be needed for installation:

- Four (4) chassis rack mount screws for each AC power supply.
- Flat-head screwdriver.
- #1 and #2 Phillips-head screwdriver.
- 10 mm wrench (for the nuts on the AC power supply).
- 7/16 wrench (for the nuts on the PEM of the VMG-14 and the circuit breaker).

### Site Space Requirements

This equipment is only intended for use in a Restricted Access Location.

Choose a site that is dry, clean, well-ventilated and air-conditioned, where the ambient temperature is between 5° C and 45° C (41° F and 113° F).

A 15A Listed circuit breaker shall be provided in the building installation for overcurrent/short circuit backup protection. One 15A circuit should be made available for each power cord set.

The AC power supply relies on the building installation's safety measures for protection against short-circuit, overcurrent, and earth (grounding) fault. Precaution must be taken to ensure these protective devices are in place prior to installation, and that they are properly rated to protect the system.

- Keep tools and chassis components off the floor and away from foot traffic.
- Clear the area of possible hazards, such as wet floors, ungrounded power cables, and missing safety grounds.
- Keep the area around the chassis free from dust and foreign conductive material.

## Rack Requirements

1. Elevated Operating Ambient – If installed in a closed or multi-rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (TMA) specified by the manufacturer.
2. Reduced Air Flow – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading – Mounting of the equipment in the rack should be in such a way as to ensure an even mechanical load in the equipment rack.
4. Circuit Overloading – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. When connecting equipment to a supply circuit, proper consideration should be taken to avoid overloading the supply circuits.
5. Reliable Earthing – Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

Each AC power supply can be installed in 19" equipment racks. The rack must be accessible from the front and rear for installation. Ensure that the rack is constructed to support the weight and dimensions of the chassis.



**Note:** *If installing the AC power supply chassis into a rack that is already partially populated, 1RU of space is required for each AC power supply chassis.*

## Warnings



**Warning!** *A qualified service person is required for proper installation of DC connections.*



**Warning!** *Hazardous voltage! Before working, ensure that the power connection cables are disconnected from power. When the system is powered on, do **NOT** touch the power terminals.*



**Warning!** *Danger of electrostatic discharge. Static electricity can harm delicate components inside each AC power supply. An ESD wrist strap must be worn before unpacking or exchanging any part or electric component.*



**Warning!** *Avoid electric overload. To avoid electrical hazard, do not make connections to terminals outside the specified voltage range for each AC power supply.*



**Warning!** *Remove jewelry (rings, watches, etc.) before working on equipment that is connected to power lines.*



**Warning!** *This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.*

## Unpacking



**Caution:** *When opening the shipping carton, use caution to avoid AC power supply damage.*

Consider the following when unpacking and storing each AC power supply:

- Leave the device packed until it is needed for installation.
- After unpacking the device, save and store the packaging material in case the unit needs to be returned.
- If the packaging is damaged and possible unit damage is present, report to the shipper and analyze the damage.

## PEM Redundancy Installation

For PEM redundancy, you will need 1 RU of space to install the AC power supply chassis. You will need an additional 3 RU of space to install the circuit breaker (1 RU for the circuit breaker and 1 RU above and below the circuit breaker for proper air circulation).

### Prior to Installing the AC Power Supply

- Install the VMG-14 chassis (allowing 13 RU of rack space) according to the instructions and parameters in *Chapter 3, Physical Installation* of the latest VMG-14 *Hardware Setup Guide*.
- Do *not* connect DC power to the VMG-14.
- Do *not* turn on the circuit breaker to the VMG-14 before completing all the steps below.
- Rackmount the circuit breaker

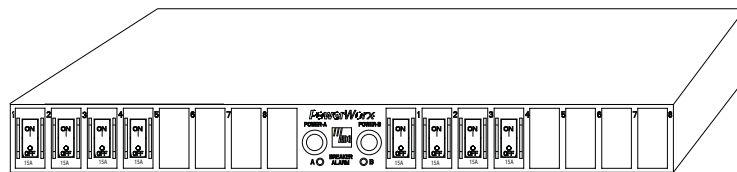


Figure 3. PowerWorx circuit breaker

**Note:** The following steps provide basic rackmount procedures for the PowerWorx Select Series Circuit Breaker. For detailed instructions on circuit breaker installation and assembly, please refer to the User Manual provided in the circuit breaker packaging, or [log in to RGB's Customer Portal](#) and search for the following term:

#### PowerWorx Select Series Circuit Breaker Manual

1. Insert the circuit breaker in a standard 19" rack *below* the VMG-14, allowing 1 RU of space both above and below the the circuit breaker.
2. Using four (4) rack mount screws, secure the circuit breaker into the rack, tightening each screw incrementally until all four are evenly snug-tight at 27 inch pounds of force (3.1 N-m).

### AC Power Supply and Circuit Breaker Installation and Wiring

This section describes the steps necessary to install the AC power supply, wire the VMG-14 to the circuit breaker, and wire the circuit breaker to the AC power supply. An overview of the steps are as follows:

- [Verify Components](#)
- [Rackmount the AC Power Supply](#)
- [Wire the VMG-14 PEMs to the Circuit Breaker](#)
- [Wire the AC Power Supply to the DC Connectors of the Circuit Breaker](#)

## A) Verify Components

1. Verify there are 8 sets of #10 AWG wires (each set contains one positive [red] and one negative [black] wire for 16 wires total) in the packaging.



Figure 4. #10 AWG wire for circuit breaker

1. Verify there are 4 AC power cords each with the appropriate plug for your country, and 2 sets of #4 AWG DC positive and negative wires in the packaging:



**Note:** For PEM Redundancy installations, the #4 AWG DC wires are shipped as follows:

- 1 pair of double-holed flat lugs coupled with 1 pair of double-holed 90° angle lugs.
- 1 pair of double-holed 45° angle lugs coupled with 1 pair of double-holed 90° angle lugs.

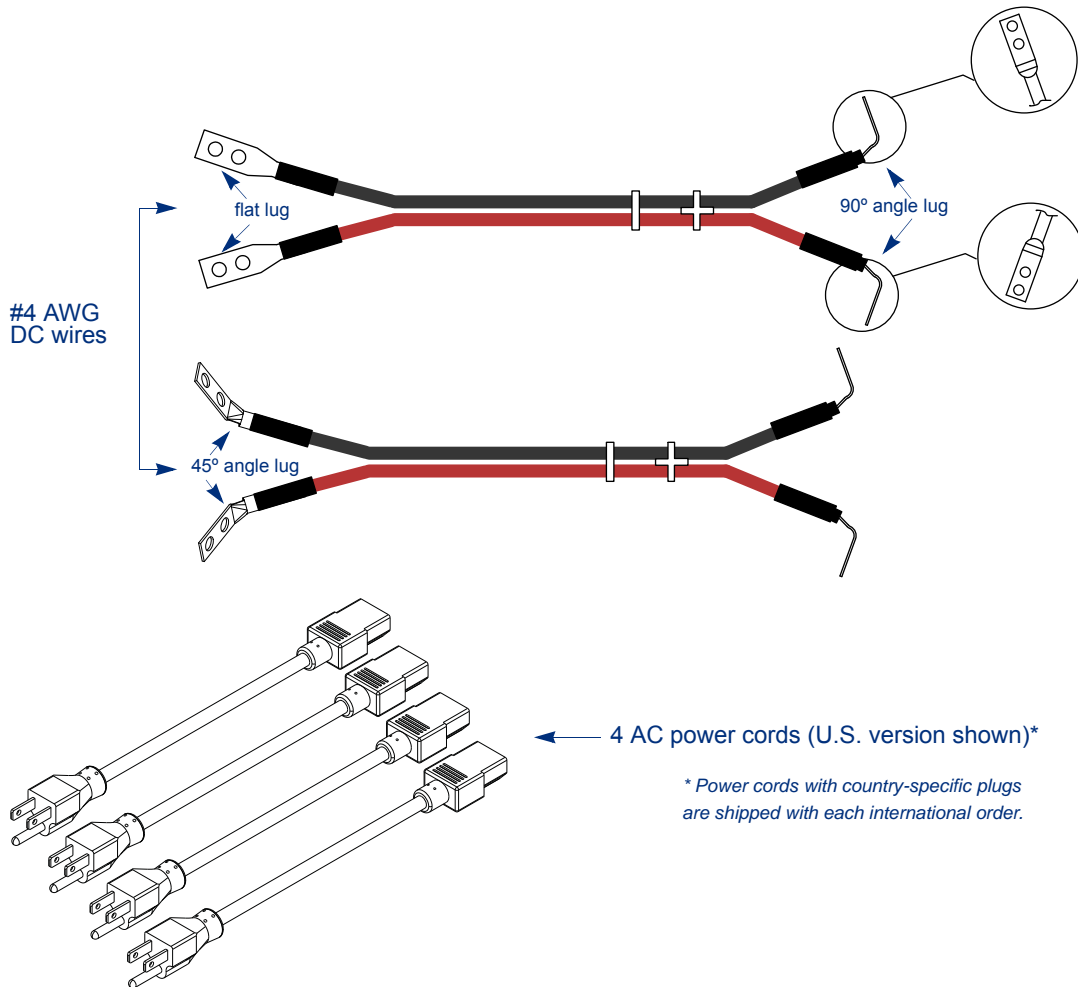


Figure 5. AC power supply packaging



2. Verify the 4 x 1000W power modules are installed, properly seated, and screwed down (no more than 3 threads) in the AC power supply unit.

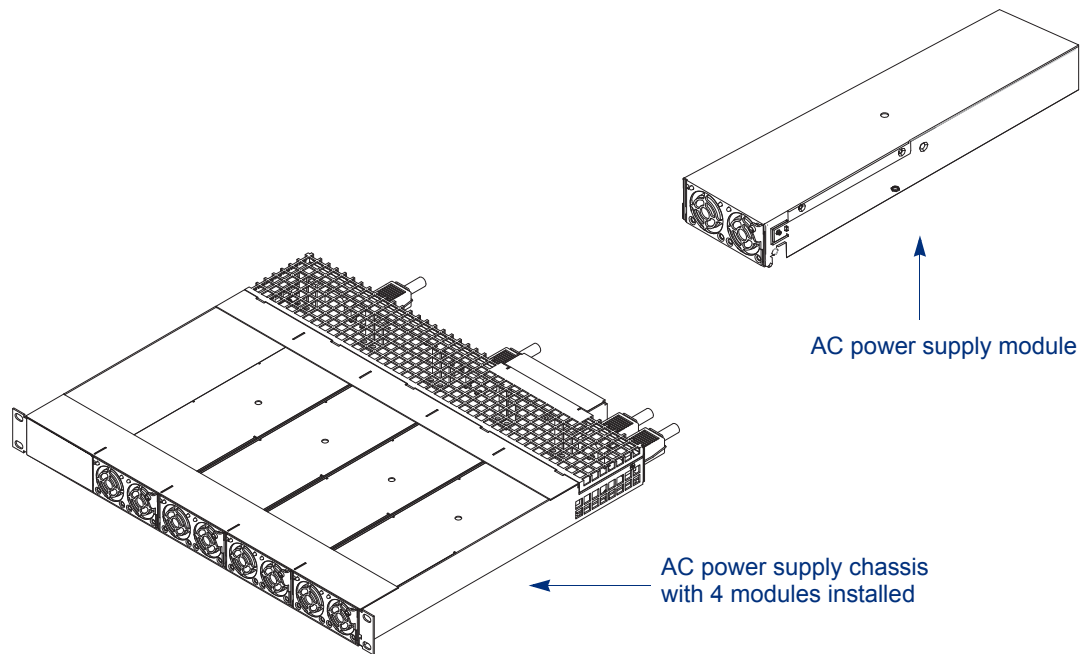


Figure 6. AC power supply unit with modules

## B) Rackmount the AC Power Supply

1. Insert the AC power supply with installed modules in the rack *below* the circuit breaker, allowing 1 RU of space between the circuit breaker and the AC power supply.

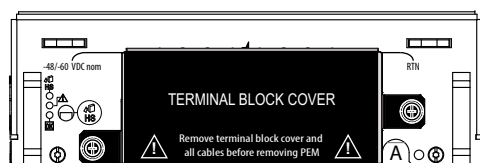


**Note:** The power supply modules are mounted from the front of the AC power supply chassis.

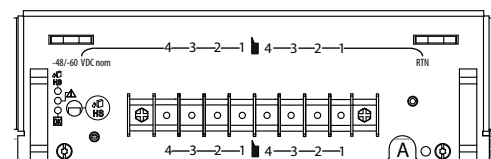
2. Using four (4) rack mount screws, secure the AC power supply into the rack, tightening each screw incrementally until all four are evenly snug-tight.

## C) Wire the VMG-14 PEMs to the Circuit Breaker

1. Remove the terminal block cover (Figure 7) from the left and right Power Entry Modules (PEM-A and PEM-B) of the VMG-14.
2. Unscrew and remove the terminal screws from the output power terminals (Figure 7). Use caution to not lose the screws.



PEM terminal block cover

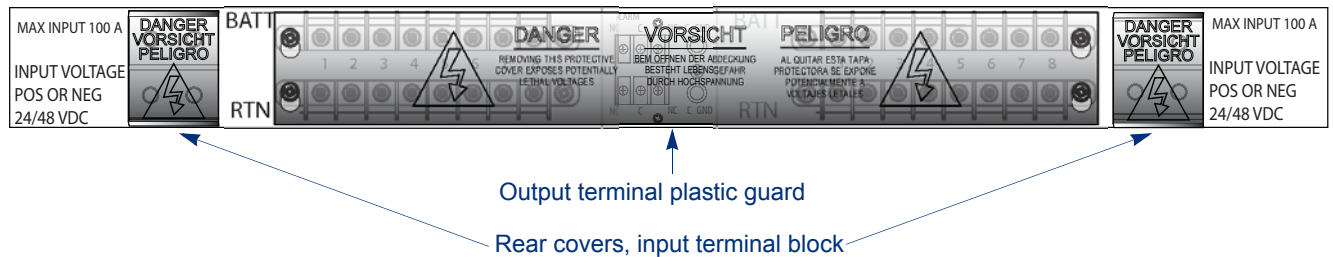


PEM terminal block cover and screws removed

Figure 7. PEM terminal block covers

3. From the rear of the circuit breaker, remove the plastic guard and rear covers from the output and input power terminal blocks (Figure 8).
4. From the rear of the circuit breaker, use a 7/16 socket wrench to remove the nuts with captive lock washers from the both sides of the input power terminal terminal blocks (Figure 8).
5. Unscrew and remove the terminal screws from the output power terminals (Figure 8). Use caution to not lose the screws.

Rear of circuit breaker, with covers and nuts



Rear of circuit breaker, covers and nuts removed

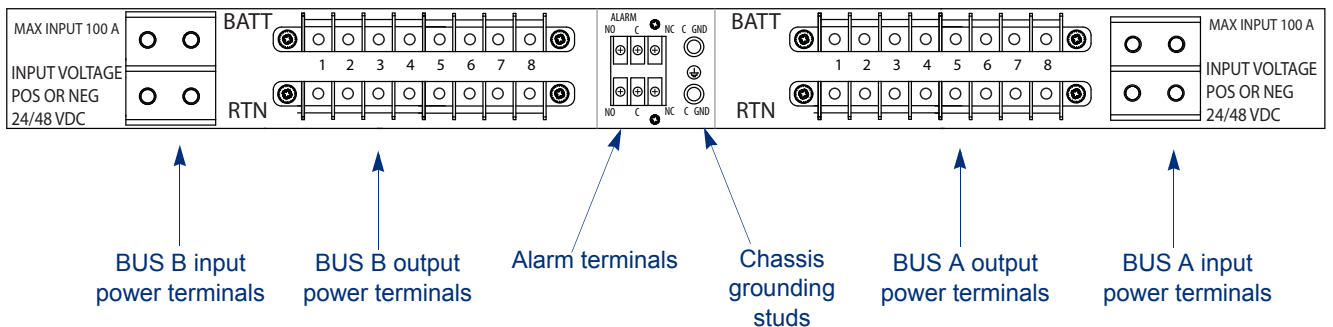


Figure 8. Circuit breaker, rear view

6. On the rear of the circuit breaker, place one side of a set of the #10 AWG ring terminals over the top and bottom number 1 slots of BUS A's output terminals as shown in Figure 9.
  - The positive (red) wire goes on the bottom and is labeled RTN; the negative (black) wire goes on the top and is labeled BATT.
  - The ring terminals should fit easily inside the output terminal bay.

7. Place the terminal screw over the ring terminal, using a torque screwdriver to tighten the screw to 15 inch pounds of force (1.7 N-m)

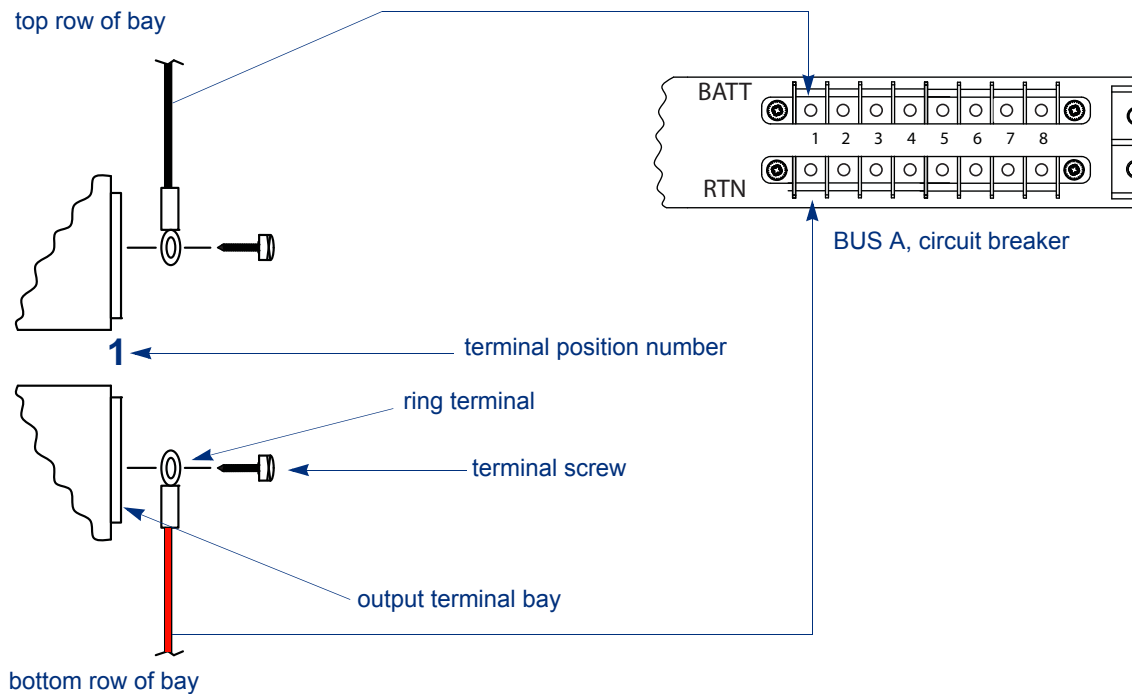


Figure 9. Circuit breaker output power ring terminal assembly

8. Place the other side of the same set of the #10 ring terminals over the two number 1 slots of PEM-A's output terminal block as seen in [Figure 10](#).
  - The positive (red) wire goes on the right side of PEM-A's terminal block labeled: RTN; the negative (black) wire goes on the left side of PEM-A's terminal block labeled: -48/-60 VDC nom.
  - The ring terminals should fit easily inside the output terminal bay.

9. Place the terminal screw over the ring terminal, using a torque screwdriver to tighten the screw to 15 inch pounds of force (1.7 N-m)

PEM-A, terminal block

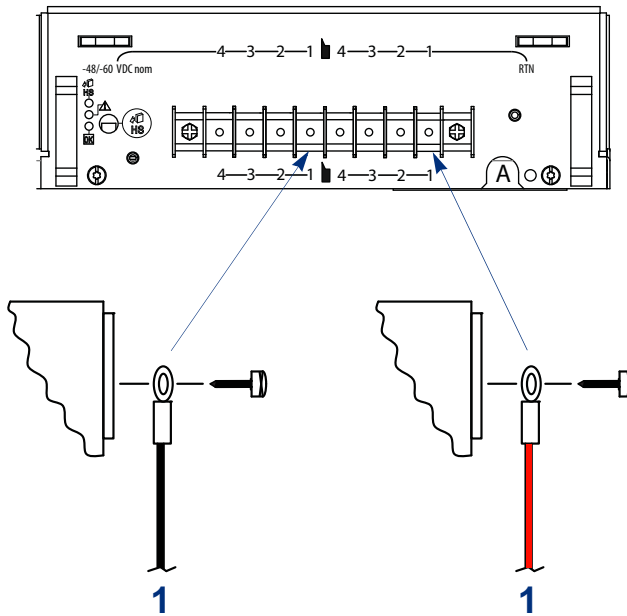


Figure 10. VMG-14, PEM-A output power ring terminal assembly

10. Repeat [Steps 6](#) through [9](#) for the remaining 3 sets of wires for positions 2-4 on BUS-A of the circuit breaker and PEM-A of the VMG-14.
11. Repeat [Steps 6](#) through [9](#) for the 1-4 positions of BUS-B on the circuit breaker, and the 1-4 positions of PEM-B on the VMG-14.

When finished, the wiring from the circuit breaker to the VMG-14 will look similar to [Figure 11](#) below:

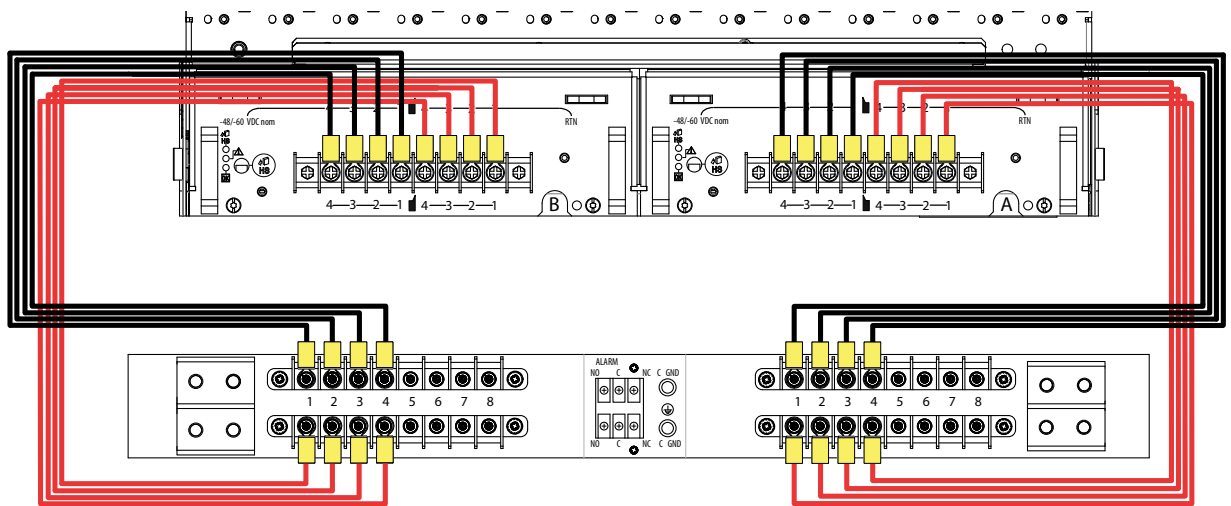


Figure 11. VMG-14 to circuit breaker wiring

12. Replace both terminal block covers to PEM-A and PEM-B of the VMG-14 ([Figure 7](#)).
13. Replace the plastic guard on the output terminal block of the circuit breaker ([Figure 8](#)).

### D) Wire the AC Power Supply to the DC Connectors of the Circuit Breaker

1. Remove the safety terminal cover from the rear of the AC power supply.
2. Remove the nuts and lock washers from the 4 DC connectors of the AC power supply.

AC power supply terminal cover, on

AC power supply terminal cover & washers, off

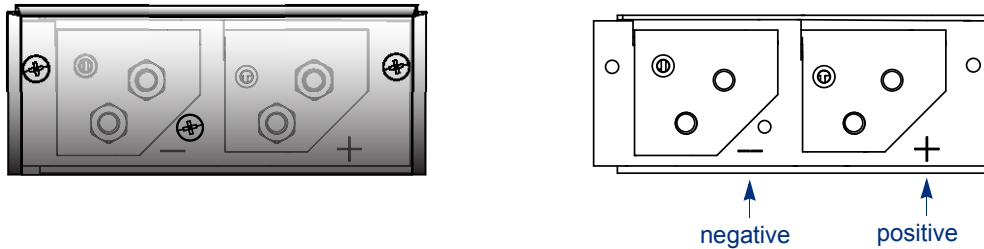


Figure 12. Terminal cover - AC power supply

3. Using one of the two sets of #4 AWG wiring pairs, place one negative, flat-angled lug (Figure 13) over the negative (left side) set of 2 DC connectors on the AC power supply (Figure 12).
4. From the same set of #4 AWG wires, place the positive, flat-angled lug (Figure 13) over the positive (right side) set of 2 DC connectors on the AC power supply (Figure 12).

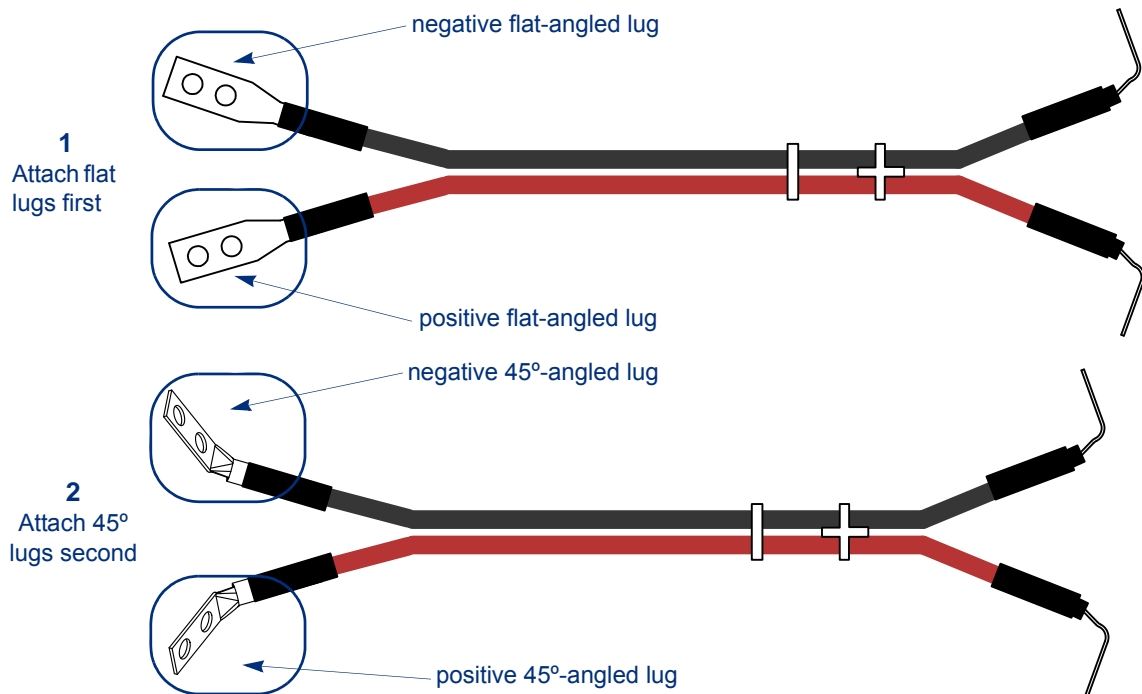


Figure 13. #4 AWG wire set, flat and 45°-angled lugs

5. Place the second set of 45°-angle lugs over the 4 (2 sets of 2) DC connectors of the AC power supply.
6. Place the 2 sets of DC wires (flat-angled and 45°-angled) such that both sets of wires exit in the same downward direction as seen in [Figure 14](#) below.

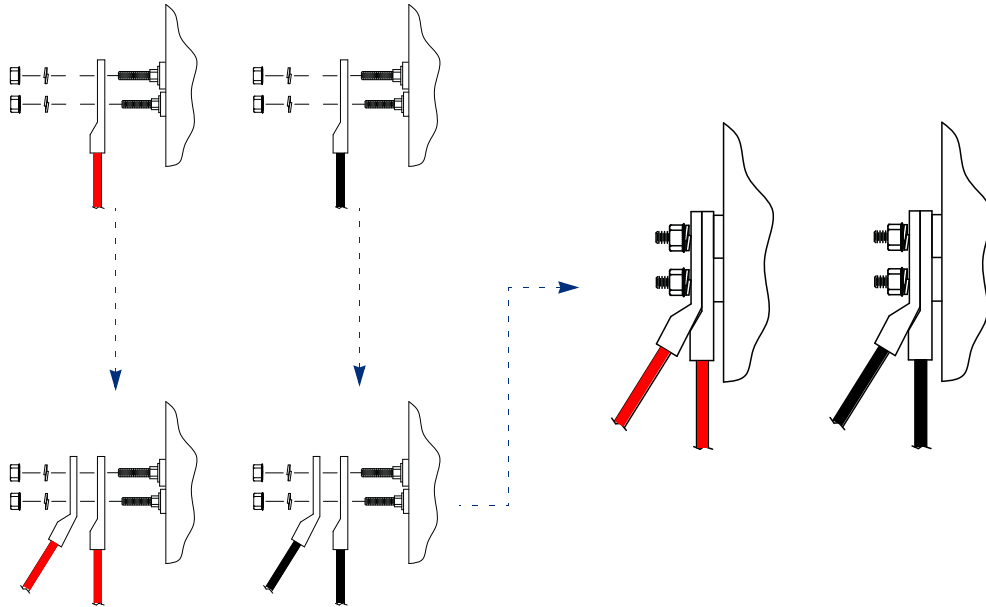


Figure 14. AC Power Supply, DC connector assembly - PEM Redundancy



**Note:** Be sure to connect the wires according to the polarities described in [Steps 3 and 4](#) above.

7. Place the lock washer, then the nut over each connector. Use a 10mm wrench to torque the bolts to 60 inch pounds of force (6.8N-m).

The wiring will look similar to [Figure 15](#):

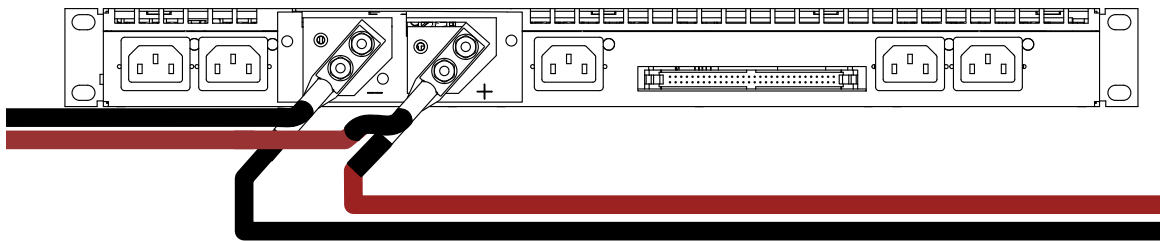


Figure 15. DC wires connected to AC power supply

8. Using one set of the other end of the #4 AWG wiring pairs, place the negative (black) right-angled lug (Figure 16) over the top pair of input DC connectors labeled BATT on BUS-A of the circuit breaker (Figure 8).

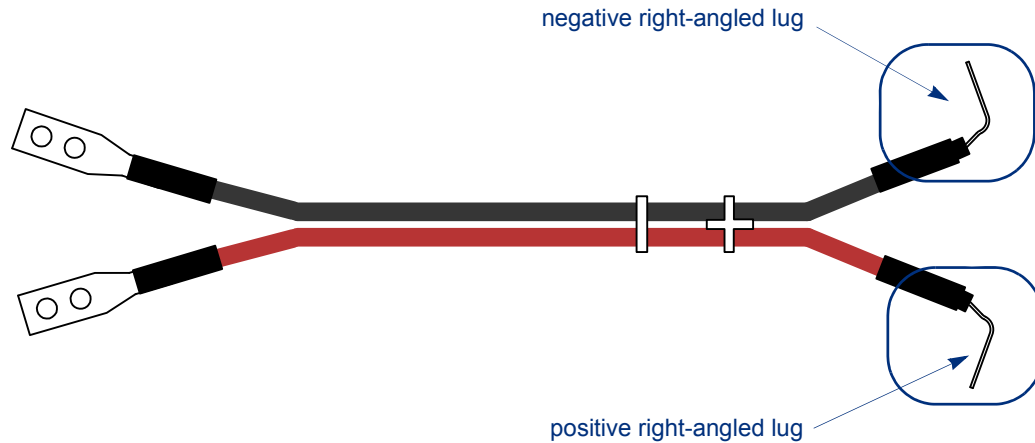


Figure 16. #4 AWG wire set, right-angled lugs

9. From the same set of #4 AWG wires, place the positive (red) right-angled lug (Figure 16) over the bottom pair of input DC connectors labeled RTN on BUS-A of the circuit breaker (Figure 8).
10. Using the second set of the other end of the #4 AWG wiring pairs, place the negative (black) right-angled lug over the top pair of input DC connectors labeled BATT on BUS-B of the circuit breaker (Figure 8).
11. From the same set of #4 AWG wires, place the positive (red) right-angled lug over the bottom pair of input DC connectors labeled RTN on BUS-B of the circuit breaker (Figure 8).

12. Use a 7/16 wrench to torque the nuts with captive washers to 32 inch pounds of force (3.6N-m).

The circuit breaker input DC terminal assembly will look similar to the drawings in [Figure 17](#).

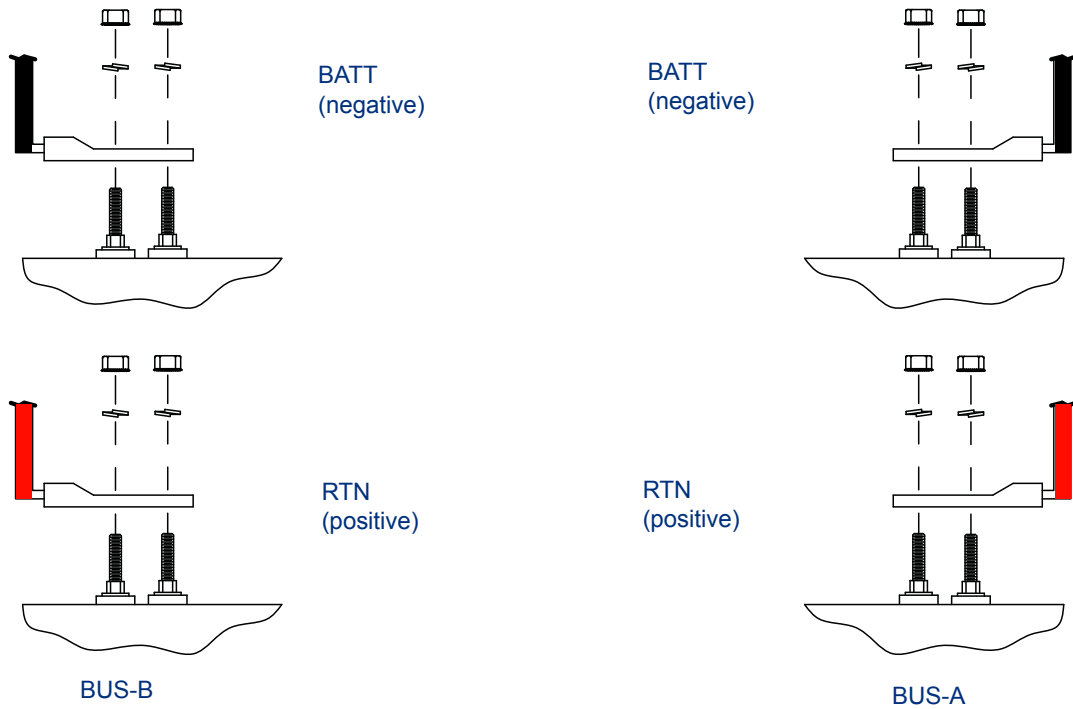


Figure 17. Circuit breaker input DC terminal assembly

The wiring from the AC power supply to the circuit breaker will look similar to [Figure 18](#):

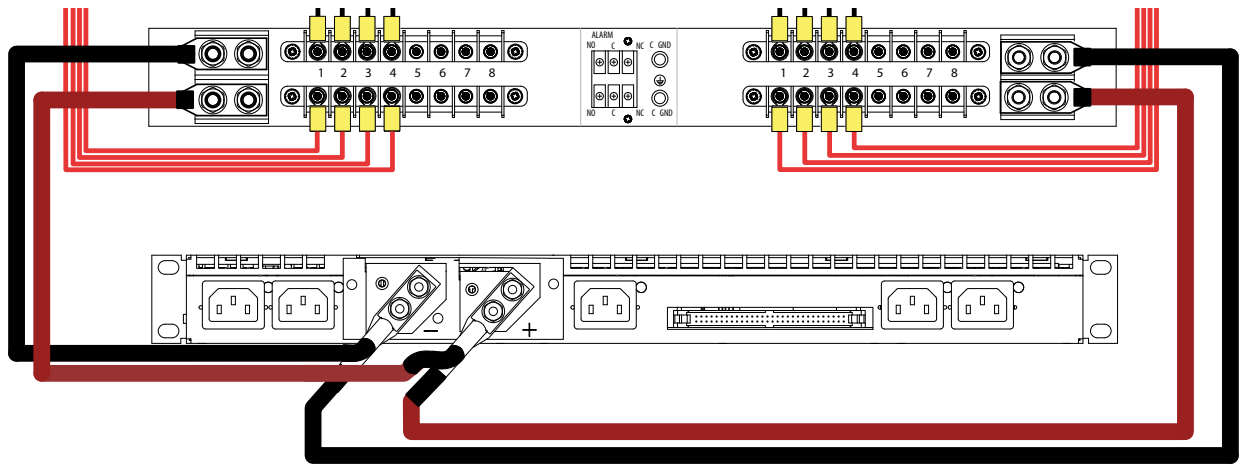


Figure 18. AC power supply to circuit breaker wiring

13. Replace the safety terminal cover ([Figure 12](#)) of the AC power supply over the DC connectors (now with DC wires installed). Use a Phillips-head screwdriver to tighten the screws of the terminal cover.



14. Replace the rear covers to the input terminal blocks of BUS-A and BUS-B on the circuit breaker (Figure 8).

When finished, the wiring from the VMG-14 to the circuit breaker to the AC power supply should look similar to Figure 1.

### Powering on the VMG-14

1. Connect the four (4) female ends of the AC power cords to the AC connectors on the back of the power supply, making sure they align with the installed power modules.
2. From the front of the circuit breaker, place the circuit breaker switches to the ON position for breakers 1-4 of BUS-A and breakers 1-4 of BUS-B.

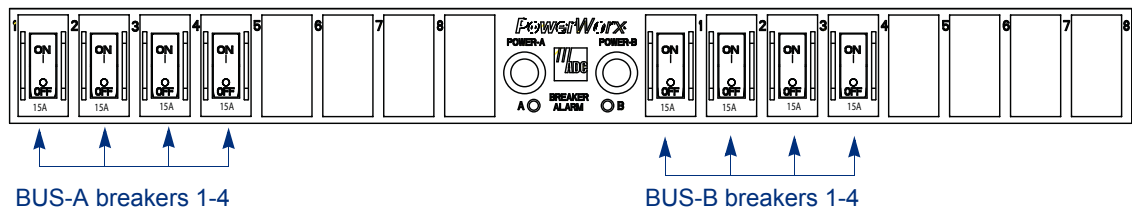


Figure 19. Circuit breakers, BUS-A / B

3. Plug the four (4) male ends of the AC power cords into an appropriate power supply.



**Note:** For U.S. configuration, each cord set (NEMA 5-15 male end) should be plugged into its own dedicated 15 or 20 Amp AC Mains Circuit.



**Warning!** Each power supply module can draw up to 12.8 amps of current at full load. If more than one power supply module is plugged into the same circuit, it may cause the AC main breaker to trip.



**Note:** For installation outside of the United States, installation must comply with local facility codes and regulations. It is recommended that each power supply have its own dedicated AC Mains Circuit of at least 15 Amps.

4. Verify that all four AC modules on the front of the AC power supply each have two green LEDs illuminated: one for AC and one for DC:

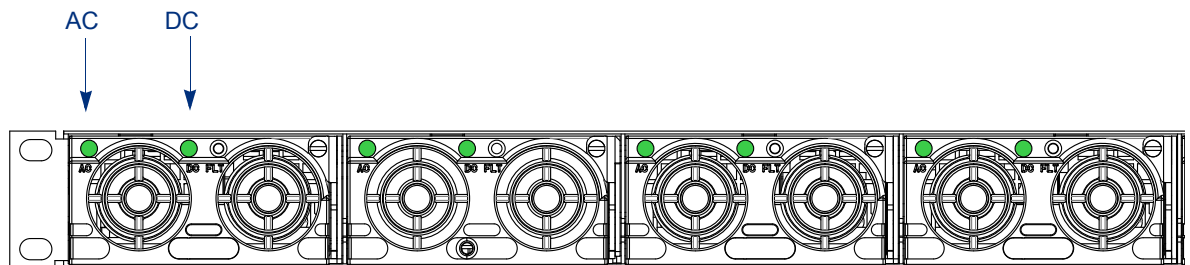


Figure 20. AC power supply chassis, front view, PEM redundancy

The AC power supply should power on the circuit breaker, which should in turn provide power to the VMG-14.

5. Verify the Power-A and Power-B LEDs on the circuit breaker are solid green as shown in Figure 21..

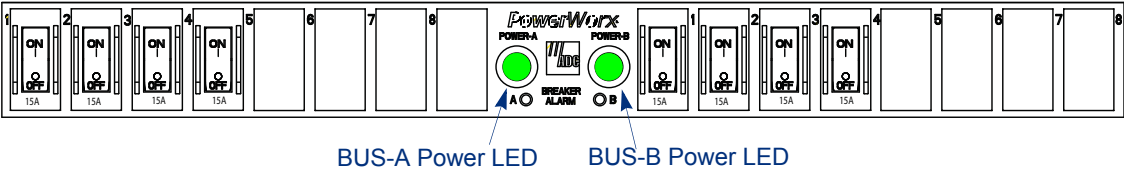


Figure 21. BUS-A/B Power-on LED indicators, circuit breaker

### Circuit Breaker to VMG-14 Power Mapping Scheme

Table 1 describes the power mapping scheme from each breaker to the physical and logical slots on the VMG-14.

Table 1. Circuit Breaker to VMG-14 Power Slot Mapping

VMG-14	Node	Node	Node	Node	Node	Node	Hub	Hub	Node	Node	Node	Node	Node	Node
Physical slot	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Logical slot	13	11	9	7	5	3	1	2	4	6	8	10	12	14
Logical VPM slot	11	9	7	5	3	1	--	--	2	4	6	8	10	12
Power Domain	1	2	1	2	2	1	2	3	4	3	4	3	3	4

## Full Redundancy Installation

For full redundancy, you will need 5 RU of space: 2 RU of space to install both AC power supply chassis and an additional 3 RU of space to install the circuit breaker (1 RU for the circuit breaker and 1 RU above and below the circuit breaker for proper air circulation).

### Prior to Installing the AC Power Supply

- Install the VMG-14 chassis (allowing 13 RU of rack space) according to the instructions and parameters in *Chapter 3, Physical Installation* of the latest VMG-14 *Hardware Setup Guide*.
- Do *not* connect DC power to the VMG-14.
- Do *not* turn on the circuit breaker to the VMG-14 before completing all the steps below.
- Rackmount the circuit breaker

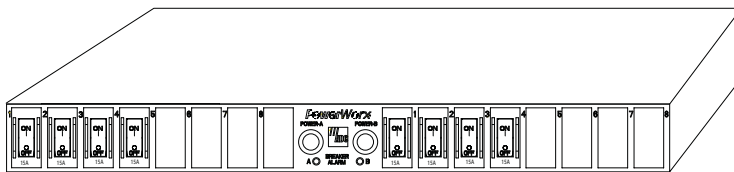


Figure 22. PowerWorx circuit breaker



**Note:** The following steps provide basic rackmount procedures for the PowerWorx Select Series Circuit Breaker. For detailed instructions on circuit breaker installation and assembly, please refer to the User Manual provided in the circuit breaker packaging, or [log in to RGB's Customer Portal](#) and [search](#) for the following term:

#### PowerWorx Select Series Circuit Breaker Manual

1. Insert the circuit breaker in a standard 19" rack *below* the VMG-14, allowing 1 RU of space both above and below the the circuit breaker.
2. Using four (4) rack mount screws, secure the circuit breaker into the rack, tightening each screw incrementally until all four are evenly snug-tight at 27 inch pounds of force (3.1 N-m).

## AC Power Supply and Circuit Breaker Installation and Wiring

This section describes the steps necessary to install both AC power supply chassis, wire the VMG-14 to the circuit breaker, and wire the circuit breaker to the AC power supply chassis. An overview of the steps are as follows:

- Verify Components
- Rackmount Both AC Power Supply Chassis
- Wire the VMG-14 PEMs to the Circuit Breaker
- Wire Each AC Power Supply to the DC Connectors of the Circuit Breaker

### A) Verify Components

1. Verify there are 8 sets of #10 AWG wires (each set contains one positive [red] and one negative [black] wire for 16 wires total) in the packaging.



Figure 23. #10 AWG wire for circuit breaker

2. Verify there are 6 AC power cords each with the appropriate plug for your country, and 2 sets of #4 AWG DC wires (2 black, 2 red) in the packaging:

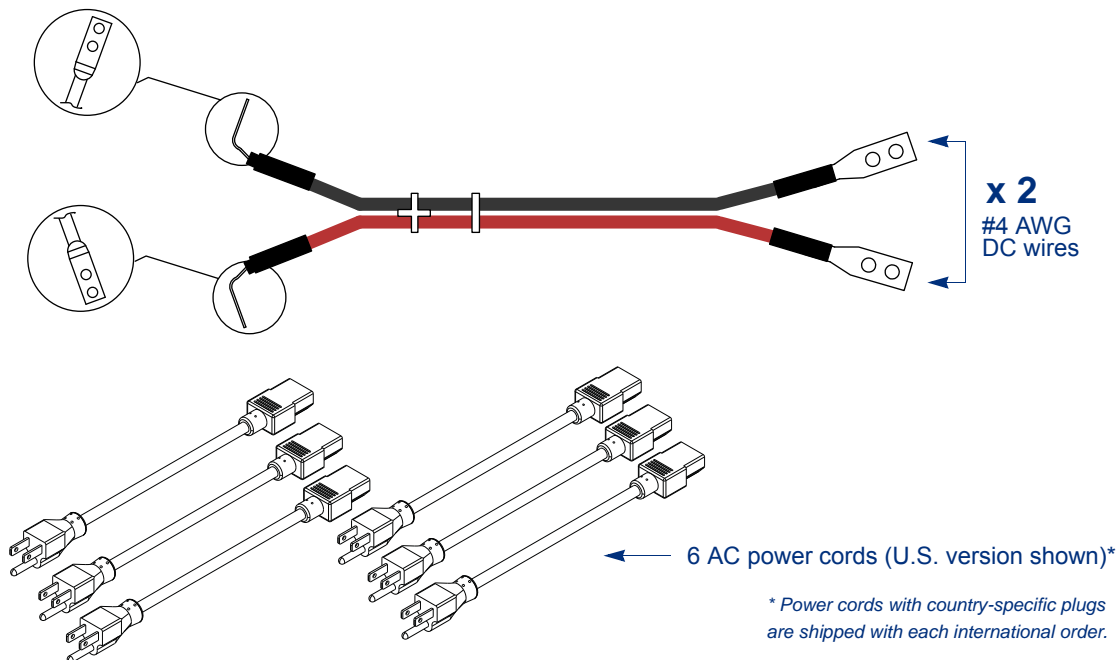


Figure 24. AC power supply packaging

3. Verify the 6 x 1000W (3 x 1000 modules per chassis) are installed, properly seated, and screwed down (no more than 3 threads) in the AC power supply unit.

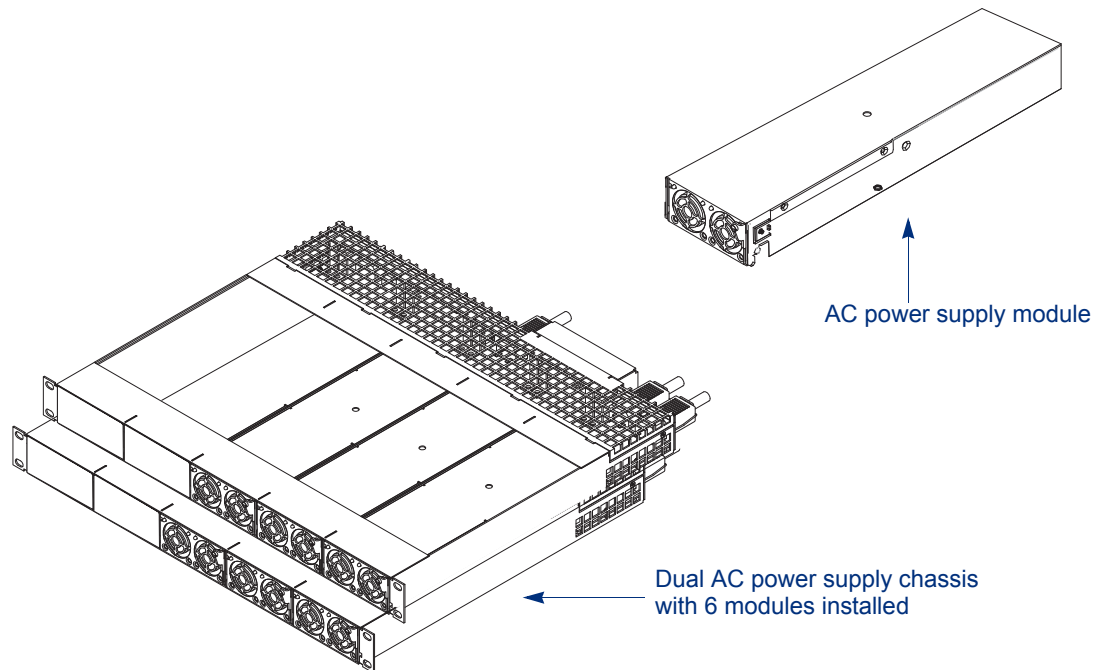


Figure 25. Dual AC power supply units with 3 modules each

## B) Rackmount Both AC Power Supply Chassis

1. Insert one AC power supply with installed modules in the rack *below* the circuit breaker, allowing 1 RU of space between the circuit breaker and the AC power supply.



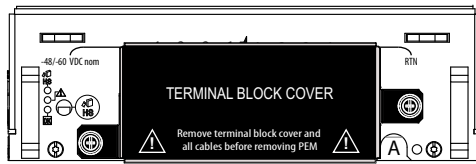
**Note:** *The power supply modules are mounted from the front of the AC power supply chassis.*

2. Using four (4) rack mount screws, secure the AC power supply into the rack, tightening each screw incrementally until all four are evenly snug-tight.
3. Insert the second AC power supply with installed modules in the rack *below* the first AC power supply, allowing 1 RU of space between both power supplies.
4. Using four (4) rack mount screws, secure the second AC power supply into the rack, tightening each screw incrementally until all four are evenly snug-tight.

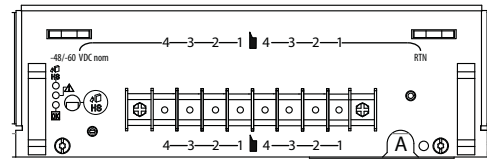
## C) Wire the VMG-14 PEMs to the Circuit Breaker

1. Remove the terminal block cover (Figure 26) from the left and right Power Entry Modules (PEM-A and PEM-B) of the VMG-14.

2. Unscrew and remove the terminal screws from the output power terminals (Figure 7). Use caution to not lose the screws.



PEM terminal block cover



PEM terminal block cover and screws removed

Figure 26. PEM terminal block covers

3. From the rear of the circuit breaker, remove the plastic guard and rear covers from the output and input power terminal blocks (Figure 27).
4. From the rear of the circuit breaker, use a 7/16 socket wrench to remove the nuts with captive lock washers from the both sides of the input power terminal terminal blocks (Figure 27).
5. Unscrew and remove the terminal screws from the output power terminals (Figure 27). Use caution to not lose the screws.

Rear of circuit breaker, with covers and nuts



Output terminal plastic guard

Rear covers, input terminal block

Rear of circuit breaker, covers and nuts removed

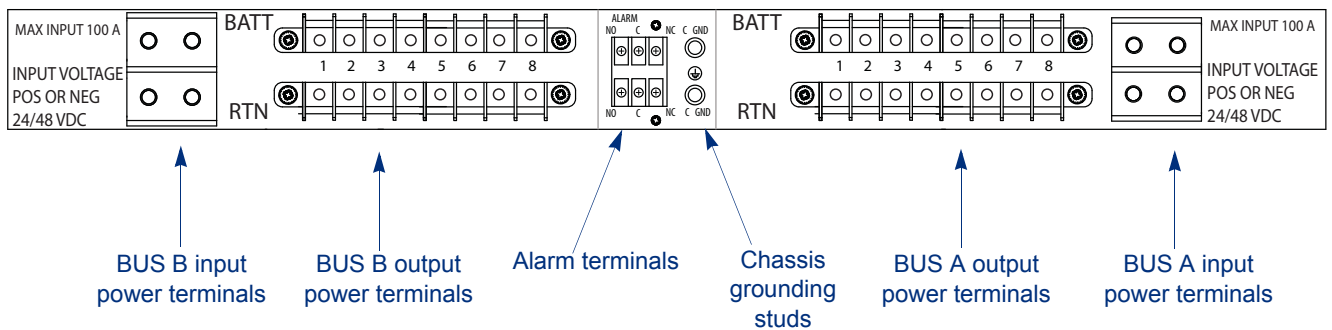


Figure 27. Circuit breaker, rear view

6. On the rear of the circuit breaker, place one side of a set of the #10 AWG ring terminals over the top and bottom number 1 slots of BUS A's output terminals as shown in Figure 28.
  - The positive (red) wire goes on the bottom and is labeled RTN; the negative (black) wire goes on the top and is labeled BATT.
  - The ring terminals should fit easily inside the output terminal bay.

7. Place the terminal screw over the ring terminal, using a torque screwdriver to tighten the screw to 15 inch pounds of force (1.7 N-m)

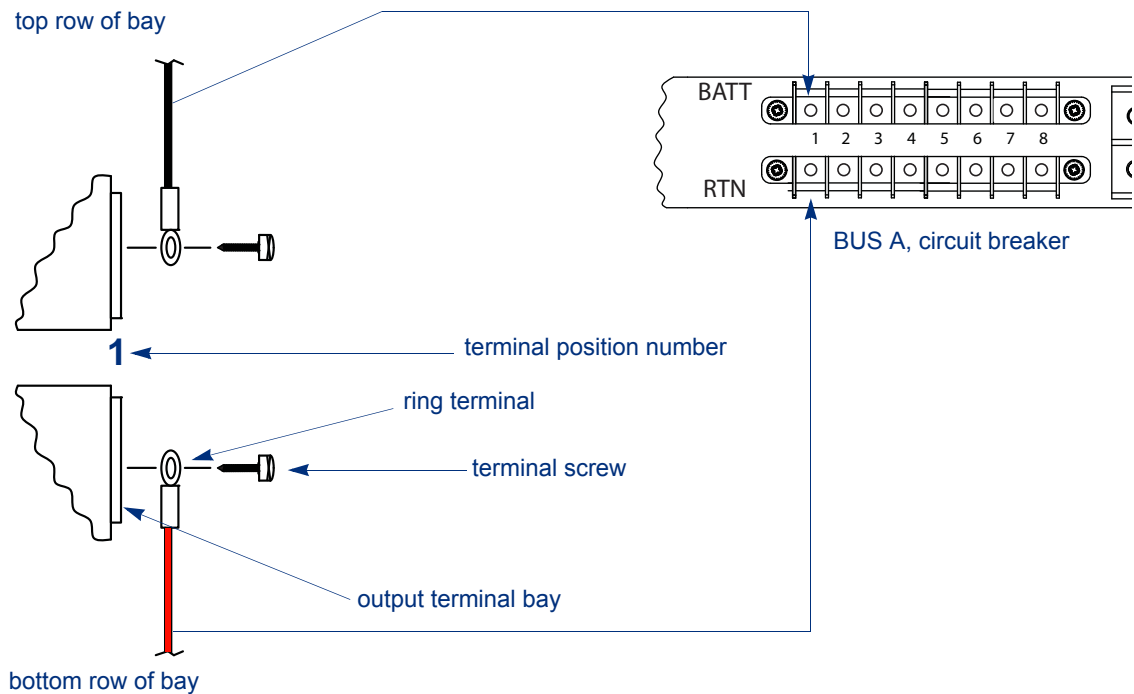


Figure 28. Circuit breaker output power ring terminal assembly

8. Place the other side of the same set of the #10 ring terminals over the two number 1 slots of PEM-A's output terminal block as seen in [Figure 29](#).
  - The positive (red) wire goes on the right side of PEM-A's terminal block labeled: RTN; the negative (black) wire goes on the left side of PEM-A's terminal block labeled: -48/-60 VDC nom.
  - The ring terminals should fit easily inside the output terminal bay.

9. Place the terminal screw over the ring terminal, using a torque screwdriver to tighten the screw to 15 inch pounds of force (1.7 N-m)

PEM-A, terminal block

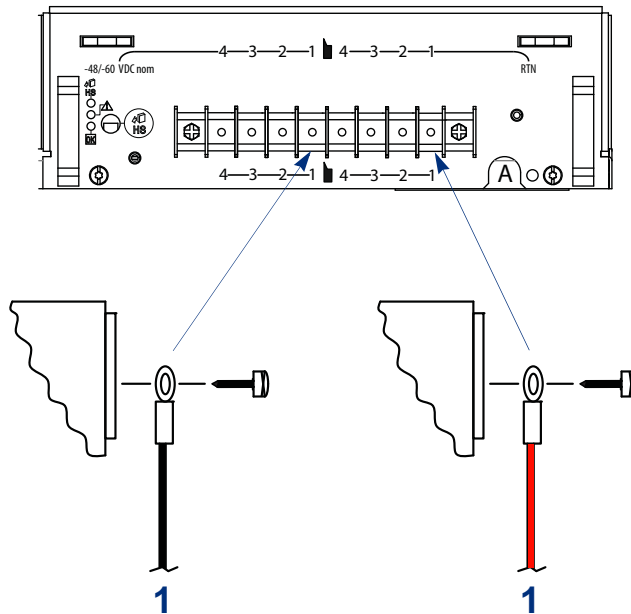


Figure 29. VMG-14, PEM-A output power ring terminal assembly

10. Repeat [Steps 6](#) through [9](#) for the remaining 3 sets of wires for positions 2-4 on BUS-A of the circuit breaker and PEM-A of the VMG-14.
11. Repeat [Steps 6](#) through [9](#) for the 1-4 positions of BUS-B on the circuit breaker, and the 1-4 positions of PEM-B on the VMG-14.

When finished, the wiring from the circuit breaker to the VMG-14 will look similar to [Figure 30](#) below:

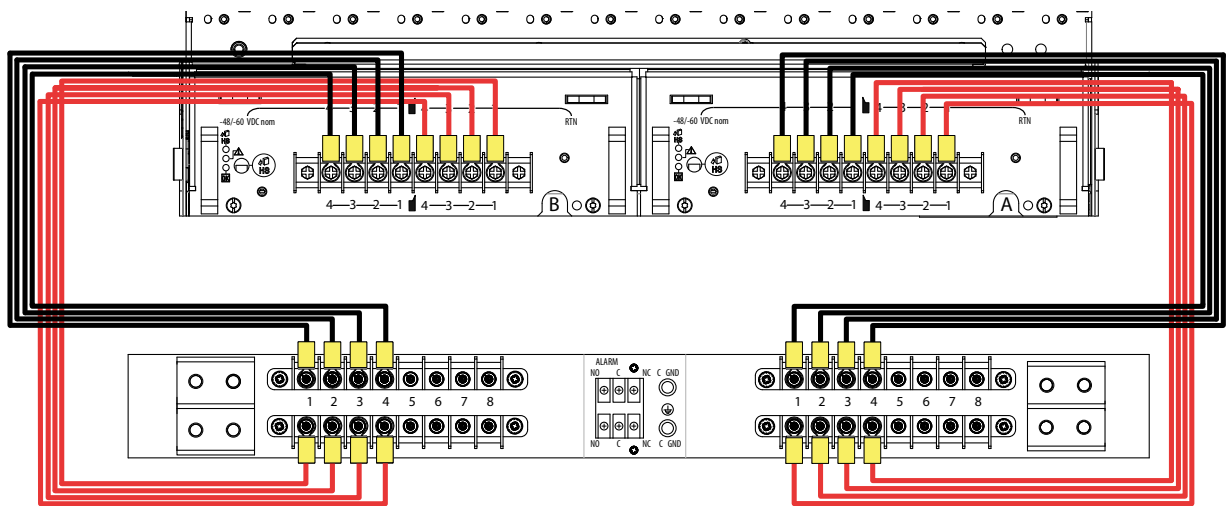


Figure 30. VMG-14 to circuit breaker wiring

12. Replace both terminal block covers to PEM-A and PEM-B of the VMG-14 ([Figure 26](#)).

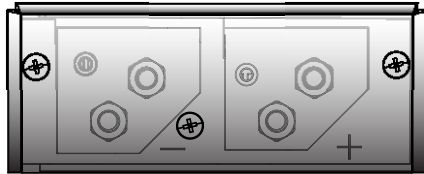


13. Replace the plastic guard on the output terminal block of the circuit breaker (Figure 27).

#### D) Wire Each AC Power Supply to the DC Connectors of the Circuit Breaker

1. Remove the safety terminal covers from the rear of each AC power supply.
2. Remove the nuts and lock washers from the 4 DC connectors of each AC power supply.

AC power supply terminal cover, on



AC power supply terminal cover & washers, off

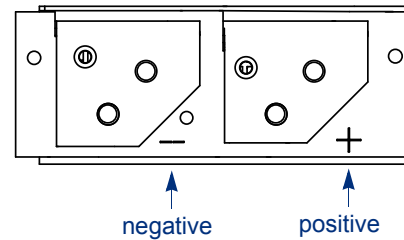


Figure 31. Terminal cover - AC power supply

3. Using one of the two sets of #4 AWG wiring pairs, place one negative, flat-angled lug (Figure 32) over the negative (left side) set of 2 DC connectors on the first AC power supply (Figure 31).

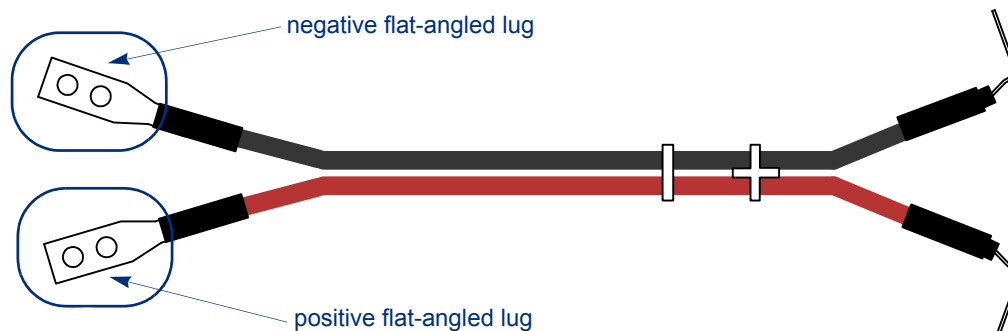


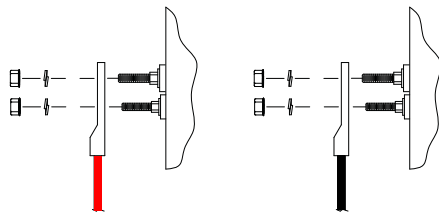
Figure 32. #4 AWG wire set, flat-angled lugs

4. From the same set of #4 AWG wires, place the positive, flat-angled lug (Figure 32) over the positive (right side) set of 2 DC connectors on the first AC power supply (Figure 31).
5. Place the second set of flat-angled lugs over the 4 (2 sets of 2) DC connectors of the second AC power supply.

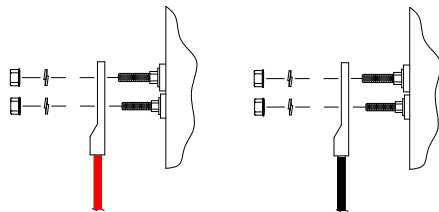


**Note:** Be sure to connect the wires according to the polarities described in [Steps 3 and 4](#) above.

The wiring will look similar to [Figure 33](#) below:



AC Power Supply # 1



AC Power Supply # 2

Figure 33. AC Power Supply, DC connector assembly - Full Redundancy

6. Place the lock washer, then the nut over each connector of each AC power supply. Use a 10mm wrench to torque the bolts to 60 inch pounds of force (6.8N-m).

The wiring will look similar to [Figure 34](#):

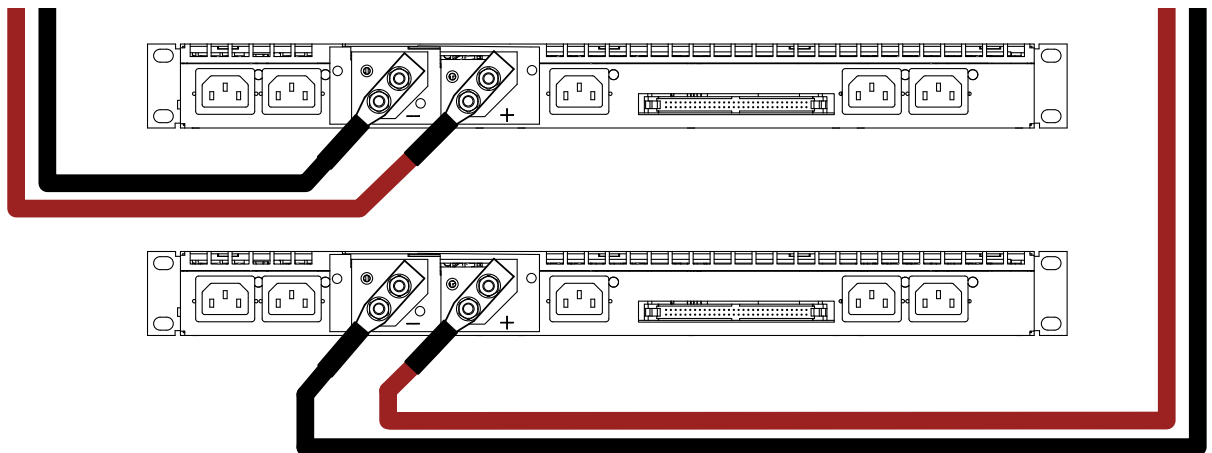


Figure 34. DC wires connected to AC power supply

7. Using one set of the other end of the #4 AWG wiring pairs, place the negative (black) right-angled lug (Figure 35) over the top pair of input DC connectors labeled BATT on BUS-A of the circuit breaker (Figure 27).

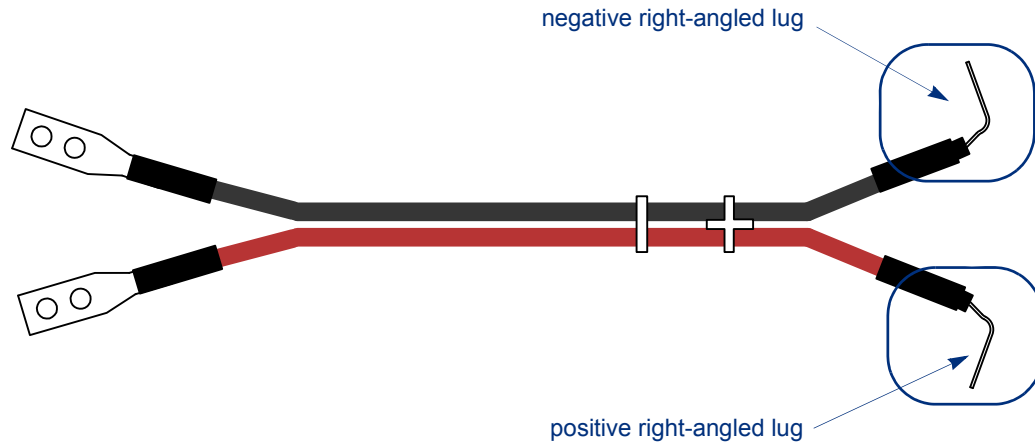


Figure 35. #4 AWG wire set, right-angled lugs

8. From the same set of #4 AWG wires, place the positive (red) right-angled lug (Figure 35) over the bottom pair of input DC connectors labeled RTN on BUS-A of the circuit breaker (Figure 27).
9. Using the second set of the other end of the #4 AWG wiring pairs, place the negative (black) right-angled lug over the top pair of input DC connectors labeled BATT on BUS-B of the circuit breaker (Figure 27).
10. From the same set of #4 AWG wires, place the positive (red) right-angled lug over the bottom pair of input DC connectors labeled RTN on BUS-B of the circuit breaker (Figure 27).

11. Use a 7/16 wrench to torque the nuts with captive washers to 32 inch pounds of force (3.6N-m).

The circuit breaker input DC terminal assembly will look similar to the drawings in [Figure 36](#).

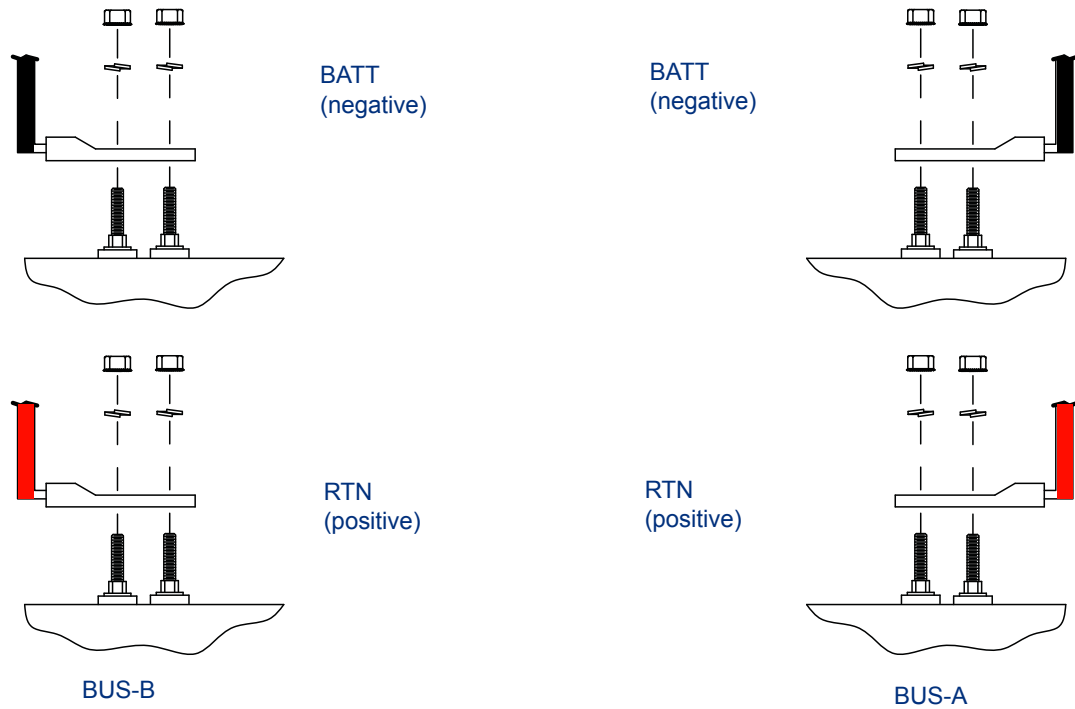


Figure 36. Circuit breaker input DC terminal assembly

The wiring from the AC power supply to the circuit breaker will look similar to [Figure 18](#):

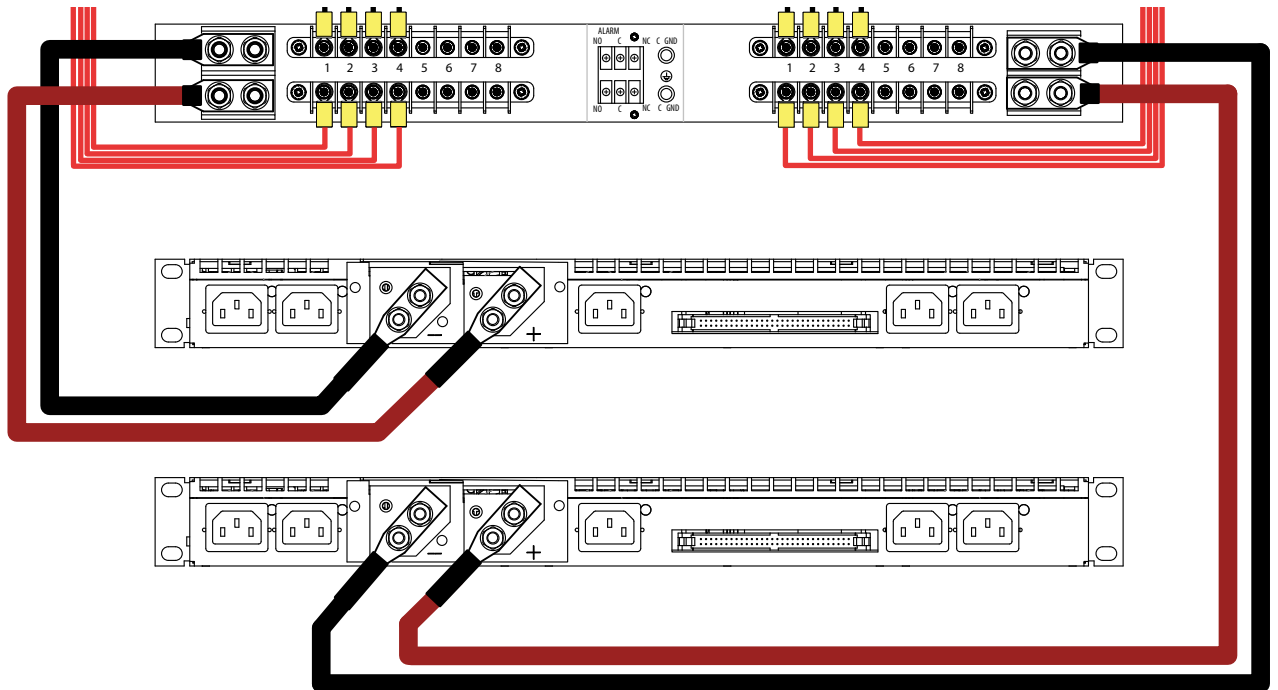


Figure 37. AC power supply to circuit breaker wiring

12. Replace the safety terminal covers (Figure 31) of each AC power supply over the DC connectors (now with DC wires installed). Use a Phillips-head screwdriver to tighten the screws of the terminal covers.
13. Replace the rear covers to the input terminal blocks of BUS-A and BUS-B on the circuit breaker (Figure 27).

When finished, the wiring from the VMG-14 to the circuit breaker to the AC power supply should look similar to Figure 2.

### Powering on the VMG-14

1. Connect the six (6) female ends of the AC power cords to the AC connectors on the back of the power supply, making sure they align with the installed power modules.
2. From the front of the circuit breaker, place the circuit breaker switches to the ON position for breakers 1-4 of BUS-A and breakers 1-4 of BUS-B.

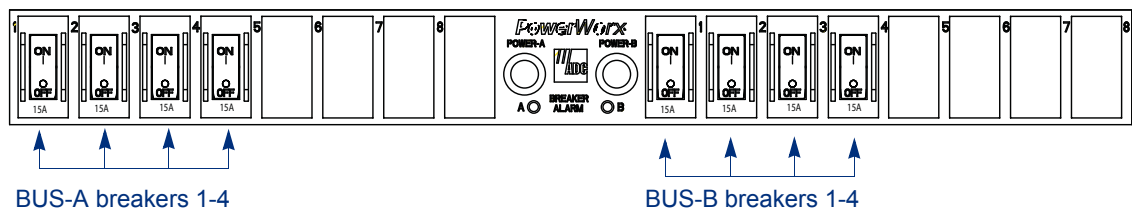


Figure 38. Circuit breakers, BUS-A / B

3. Plug the six (6) male ends of the AC power cords into an appropriate power supply.



**Note:** For U.S. configuration, each cord set (NEMA 5-15 male end) should be plugged into its own dedicated 15 or 20 Amp AC Mains Circuit.



**Warning!** Each power supply module can draw up to 12.8 amps of current at full load. If more than one power supply module is plugged into the same circuit, it may cause the AC main breaker to trip.



**Note:** For installation outside of the United States, installation must comply with local facility codes and regulations. It is recommended that each power supply have its own dedicated AC Mains Circuit of at least 15 Amps.

4. Verify that all six AC modules on the front of the AC power supply each have two green LEDs illuminated: one for AC and one for DC:

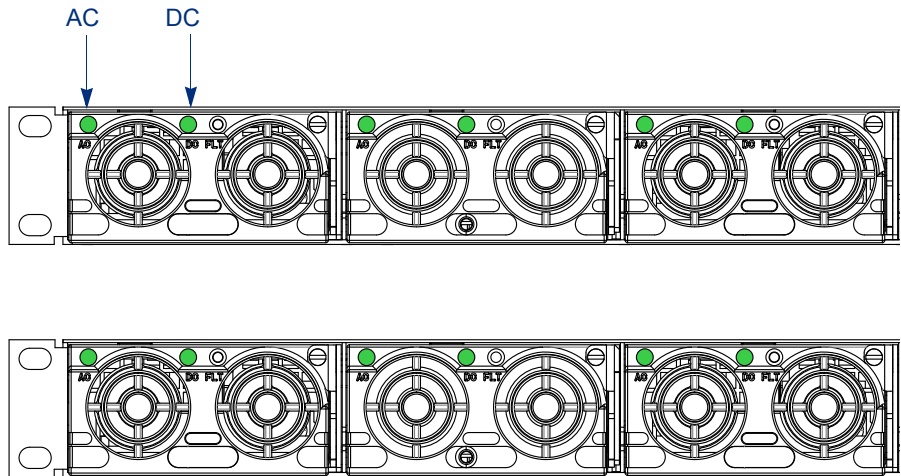


Figure 39. AC power supply chassis, front view, full redundancy

Each AC power supply should power on the circuit breaker, which should in turn provide power to the VMG-14.

5. Verify the Power -A and Power -B LEDs on the circuit breaker are solid green as shown in Figure 40..

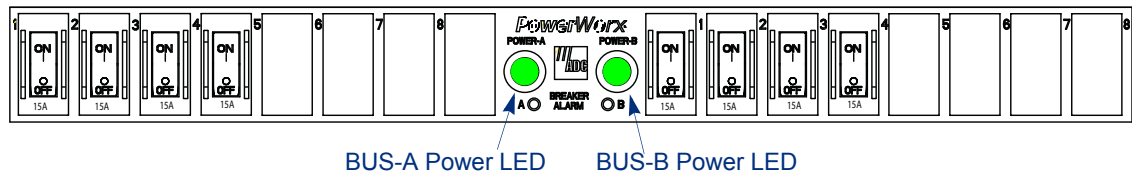


Figure 40. BUS-A/B Power-on LED indicators, circuit breaker

## Circuit Breaker to VMG-14 Power Mapping Scheme

Table 1 describes the power mapping scheme from each breaker to the physical and logical slots on the VMG-14.

Table 2. Circuit Breaker to VMG-14 Power Slot Mapping

VMG-14	Node	Node	Node	Node	Node	Node	Hub	Hub	Node	Node	Node	Node	Node	Node
Physical slot	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Logical slot	13	11	9	7	5	3	1	2	4	6	8	10	12	14
Logical VPM slot	11	9	7	5	3	1	--	--	2	4	6	8	10	12
Power Domain	1	2	1	2	2	1	2	3	4	3	4	3	3	4

# Specifications

The following chapter provides specification information for the Cherokee power supply module, part number: CAR1248FP, and the ADC Select Series Circuit Breaker.

## In This Chapter:

- “Power Module Specifications,” next.
  - “Input Specifications,” next.
  - “Output Specifications” on page 32.
  - “Safety Aspects” on page 32.
- “Circuit Breaker Specifications” on page 32
  - “Physical Specifications” on page 32
  - “Environmental Specifications” on page 33
  - “Standards” on page 33
  - “Warranty” on page 33

## Power Module Specifications

### Input Specifications

Table 3. Input Specifications

Variable	Description
Input Voltage	Range: 85-264 VAC
Input Frequency	Range: 47-63 Hz
Under-Voltage	The power supply switches off when mains voltage goes beyond the specified range. When active, the green LED is switched OFF on the front panel to generate a specific alarm. Turn off $\leq$ 80 VAC
Maximum Input Current	12.75A (full load, $V_{in}$ = 100VAC)
Power Factor	0.99 typical at nominal line and full load
Efficiency	85% typical at 90 VAC
Input Fuse	Two fuses (line and neutral) - 20A & 250 VAC, Type 3AB Axial
Inrush Current	Max 40A pk (measured at 25° for all line conditions typical duration 10ms)
Input Leakage Current	3mArms (250VAC & 60 Hz)
Hold-up Time	20ms at 1000W (typical) @ 90 VAC input

## Output Specifications

Table 4. Output Specifications

Variable	Description
Output Voltage	Nominal output: +48 V <sub>out</sub> , ±0.5%
Output Current (nominal)	20.8A @ +48V nom for low line operation (90VAC)
Current Limit	The unit is self-protected via constant current limit characteristic between the range of 110% - 130% of I <sub>out</sub> nominal
Short Circuit	hiccup mode protection, self-resetting upon clearance of the fault condition.
Output Power	1000 W at low line* operation (90 VAC). *Unit derates below 90 VAC (input) to 900W

## Safety Aspects

Table 5. Safety Aspects

Variable	Description
Applicable Standards	IEC 950 (per EN 60950) CSA C22.2-950 UL 1950 CE Mark (LVC)

## Circuit Breaker Specifications

### Physical Specifications

Table 6. Physical Specifications

Variable	Description
Dimensions	(HxWxD): 1.75" x 17.12" x 10" (44 x 435 x 254 mm). Dimensions do not include depth of power connectors, alarm LEDs, or circuit breakers.
Weight	Approximately 13 lbs (4.9 kg)
Rack Mounting Width	19" or 23" (483 or 584 mm) recess-mountable mounting brackets. WECCO/ EIA rack-mountable.
Panel Capacity	60 Amps maximum per bus (120 Amps total, dual bus configuration) 15 Amps circuit breaker x 4.
Operating Voltage	±48 V DC (42 to 56 V DC tolerance)
Power Dissipation	80 watts maximum
Fail Alarm Indicators	Red LED indicates tripped breaker. Green LED indicates power on. Alarm output contacts provided for audible, visual, and remote alarms.
Input Power Feed Connection	Two-hole compression lug (stud-type), 4 AWG.



Table 6. Physical Specifications

Variable	Description
Output Power Feed Connection	Screw-down barrier terminal strip, 10 AWG. Post Size: 8-32 (distance between barrier walls: 0.378" (9.60 mm)).
Grounding	Two-post grounding accepts range of wire up to 10 AWG. Grounding can be done with two #10 wires and two #10 ring terminals, or use larger AWG sizes across both studs.

## Environmental Specifications

Table 7. Environmental Specifications

Variable	Description
Storage Temperature	-40° to +85° C (40° to 185°F).
Operating Temperature	-40° to +65° C (40° to 149° F)
Operating Humidity	0% to 95%, non-condensing.
Operating Altitude	Up to 13,000 feet (3.96 km)

## Standards

Table 8. Standards

Variable	Description
Standards	Meets UL, Telcordia (Bellcore), NEC 2002, CSA, NEBS Level 3, and CE standards.

## Warranty

Table 9. Warranty

Variable	Description
Warranty	5 years.



## *Additional Information*

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### **In This Chapter:**

- “Cherokee Power Supply and Module Documentation,” next.
- “ADC PowerWorx Select Series Circuit Breaker” on page 35.
- “Contacting RGB Networks Customer Support” on page 36.

### **Cherokee Power Supply and Module Documentation**

For additional information such as specifications and functional design of the Cherokee AC power supply and its modules, [log in to RGB’s Customer Portal and search](#) for the following terms:

**VMG AC Power Supply Specification**

-and-

**VMG AC Power Module Specification**

### **ADC PowerWorx Select Series Circuit Breaker**

For additional information such as specifications and functional design of the ADC PowerWorx circuit breaker, [log in to RGB’s Customer Portal and search](#) for the following terms:

**PowerWorx Select Series Circuit Breaker User Manual**

## Contacting RGB Networks Customer Support

If you have any questions or problems with this installation, please contact RGB Networks Customer Support:

Before you contact Customer Support, have the following information handy:

- Serial number of the AC power supply.
- A clear description of the problem.
- Steps to reproduce the problem, if applicable.

Customers who purchased their product directly from RGB Networks, or have purchased extended product support directly from RGB Networks should contact Customer Support via one of the following methods:

Table 10. Contacting Customer Support

Method	Details
Phone	+1 (877) RGB-NETW (877-742- 6389) or +1 (408) 701-2800
Customer Portal	<a href="http://support.rgbnetworks.com">http://support.rgbnetworks.com</a>
Email	<a href="mailto:support@rgbnetworks.com">support@rgbnetworks.com</a>

## Searching the RGB Customer Portal

To search the RGB Customer Portal for a specific document or solution, proceed as follows:

1. Log in to the [RGB Customer Portal](http://support.rgbnetworks.com) site.

**RGB Customer Portal**

Welcome! You've arrived at the login page for RGB's Support Services. Here you will be able to:

- Create and track your own case reports
- Search our knowledge base for helpful information
- Download useful product documentation

**Please note:** RGB Customer Portal access is available to direct customers and resellers only. If you purchased your RGB equipment through a channel, please [go here](#).

**Secure Customer Login**

User Name:

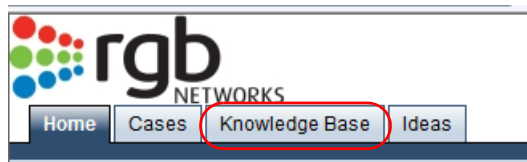
Password:

[Forgot your password?](#)

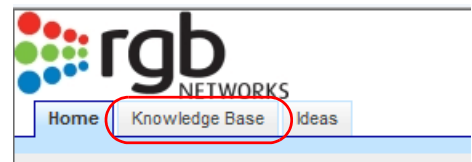
[Not registered yet? Request login credentials here.](#)

Figure 41. RGB Customer Portal home page

2. From the Customer Portal homepage, click on the **Knowledge Base** tab:



Direct Customers - RGB Customer Portal home



Resellers - RGB Customer Portal home

Figure 42. Customer Portal home page - Direct and Reseller

3. From the **Knowledge Base** homepage, enter the desired search term in the **Search** box and tap the [Enter] key:



Direct Customers - Knowledge Base search



Resellers - Knowledge Base search

Figure 43. Knowledge Base search - Direct and Reseller

