

Eaton® Remote Power Panel (RPP)

User's Guide



Powering Business Worldwide

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Class A EMC Statements

FCC Part 15

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

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- EU Directives: 73/23/EEC, Council Directive on equipment designed for use within certain voltage limits
93/68/EEC, Amending Directive 73/23/EEC
89/336/EEC, Council Directive relating to electromagnetic compatibility
92/31/EEC, Amending Directive 89/336/EEC relating to EMC

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Special Symbols

The following are examples of symbols used on the product to alert you to important information:



RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

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Chapter 1 Introduction

The Eaton® Remote Power Panel (RPP) is designed to provide increased distribution capacity in a small, compact cabinet without the need for costly electrical rework. Providing outstanding performance and reliability, the Eaton unique benefits include the following:

- 208V, 60 Hz or 400V, 60Hz power distribution unit, delivering up to 168 branch breakers
- Available in a small footprint design for limited space applications or a large footprint design to line up and match with other data center product.
- Standard top or bottom cable entry in a free-standing structure
- Easy installation and servicing with front access, spacious wireways, removable side panels, and hinged interior barriers and exterior doors
- Displays located on the exterior doors for ease of use
- Standard locking door latches with included key
- Firmware that is service upgradable through the DB-9 communication port
- Backed by worldwide agency approvals

The following options for the Eaton RPP are available:

- Up to four Eaton or Square D® 42-pole, three-phase panelboards (two front, two rear). Each panelboard is protected by a three-pole 225A or 400A, 600V rated breaker.
- Up to two Cooper Bussmann Quick-Spec bolt-on 42-pole fusible, three-phase panelboards (one front, one rear)
 - 225AF Panel Main Switch
 - 200A main fuse
 - 200 kA at 400 Vac
 - Fused disconnects for branch circuits
 - Indicating and non-indicating CUBEFuse ratings from 1A to 60A.
- 80% or 100% rated input breakers with standard, high or ultra-high interrupt capacity:
 - Standard KAIC (65 kA at 208 Vac or 35 kA at 400 Vac)
 - High KAIC (100 kA at 208 Vac or 65 kA at 400 Vac)

Note: 100% rated ultra-high interrupt capacity breaker is not available.

- Ultra-High KAIC (200 kA at 208 Vac or 100 kA at 400 Vac)
- Input connection options:
 - Direct connection to each 225A panelboard breaker (front and rear)
 - Connection into a single main lug option (MLO). Each MLO is rated at 450A or 900A and can feed up to four 225A or 400A panelboards.
 - Connection into dual main lug option (MLO). Each MLO is rated at 450A or 900A and can feed up to two 225A or 400A panelboards.
- Optional prewired shunt trip terminals can be used to easily connect main breaker shunt trips to emergency off devices.
- Optional prewired auxiliary contact terminals can be used to monitor the breaker open or closed status.

- Front and rear barrier plate for isolating dual source inputs
- Optional Energy Management System (EMS) monitoring on front and/or rear: EMS provides two levels of configuration and metering, from basic activity monitoring to branch circuit monitoring (BCM). With BCM, you can see the current values of each of the distribution branch breakers, letting you measure, plan, and manage power with greater precision. EMS also provides communication options such as building alarm monitoring and network connectivity.
- Optional see-through doors allow you to visually inspect the state of branch circuit breakers without opening the front doors.
- Optional surge protection with Surge Protective Device (SPD)
- Easy conversion to isolated ground by the customer.

Figure 1 shows an RPP.

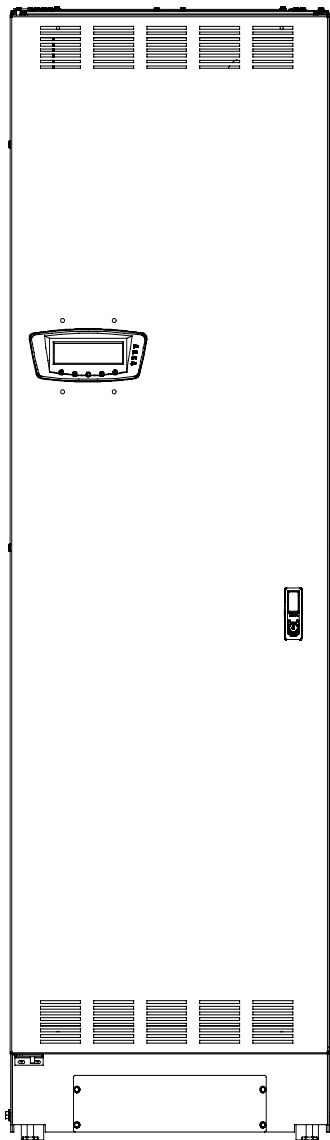


Figure 1. Small or Large RPP (Front View)

Chapter 2 Safety Warnings

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the Eaton Remote Power Panel (RPP). Please read all instructions before operating the equipment and save this manual for future reference.

The RPP is designed for industrial or computer room applications, and contains safety shields (interior barriers) behind the doors. However, the EMS-RPP system is a sophisticated power system and should be handled with appropriate care.

DANGER

The RPP contains LETHAL VOLTAGES. All repairs and service should be performed by AUTHORIZED SERVICE PERSONNEL ONLY. There are NO USER SERVICEABLE PARTS inside the RPP with the exception of adding and wiring branch circuit breakers.

WARNING

- RISK OF ELECTRIC SHOCK. The electrical enclosure of this unit must be bonded to the Building Grounding Electrode for safe operation. Do not use the isolated ground feature without bonding the RPP enclosure to the Building Grounding Electrode.
- RISK OF ELECTRIC SHOCK. This unit may receive power from more than one source. Disconnect all AC sources before servicing.
- To reduce the risk of fire or electric shock, install this RPP in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104°F). Do not operate near water or excessive humidity (95% maximum). The system is not intended for outdoor use.
- Ensure all power is disconnected before performing installation or service.
- As a result of the connected loads high leakage current is possible. Connection to earth ground is required for safety and proper product operation.

CAUTION

- Keep the RPP doors closed to ensure proper cooling airflow and to protect personnel from dangerous voltages inside the unit.
- Do not operate the RPP close to gas or electric heat sources.
- Locate the RPP on concrete or other non-combustible surface only.
- The operating environment should be maintained within the parameters stated in this manual.
- Keep surroundings uncluttered, clean, and free from excess moisture.
- Use leveling feet only for distributing the weight of the cabinet equally. Using the leveling feet to raise the cabinet may result in serious injury to personnel or damage to the cabinet.
- Observe all DANGER, CAUTION, and WARNING notices affixed to the inside and outside of the equipment.

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Chapter 3 Installation

This section explains:

- Equipment inspection
- Unpacking the cabinet
- Checking the accessory kit
- Locating the cabinet
- Installation and wiring
- Initial startup
- Completing the installation checklist

Inspecting the Equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

To file a claim for shipping damage or concealed damage: 1) File with the carrier within 15 days of receipt of the equipment; 2) Send a copy of the damage claim within 15 days to an Eaton service representative.

Tools Required

To assemble the components, the following tools may be needed:

- Medium flat-bladed screwdriver
- Phillips® #2 screwdriver
- Metric wrenches or sockets
- Forklift or pallet jack

Unpacking the Cabinet



CAUTION

- Only qualified personnel should be permitted to perform any work associated with this equipment.
- Unpacking the cabinet in a low-temperature environment may cause condensation to occur in and on the cabinet. Do not install the cabinet until the inside and outside of the cabinet are absolutely dry (hazard of electric shock).
- The cabinet is heavy (see page Table 16 on page 43). If unpacking instructions are not closely followed, the cabinet may tip and cause serious injury.
- Do not tilt the cabinet more than $\pm 10^\circ$ during installation.
- Do not install a damaged cabinet. Report any damage to the carrier and contact an Eaton service representative immediately.

The cabinet is shipped bolted to a wooden pallet and protected with outer protective packing material. Do not remove protective packaging until the equipment is ready for installation. Do not loosen the cabinet from the pallet until all forklift handling is complete.

To unpack the cabinet:

1. Carefully inspect the outer packaging for evidence of damage during transit.
2. Use a forklift or pallet jack to move the packaged cabinet to the installation site, or as close as possible, before unpacking. Insert the forklift or pallet jack's forks between the pallet supports on the bottom of the unit.

Note: Verify that the forklift or pallet jack is rated to handle the weight of the cabinet (see Table 16 on page 43 for cabinet weight).

3. Set the pallet on a firm, level surface, allowing a minimum clearance of 3m (10 ft) on each side for removing the cabinet from the pallet.
4. Remove the protective outer packaging from the cabinet.
5. Discard or recycle the packaging in a responsible manner, or store it for future use.
6. Using a wrench, remove the two metal angle brackets at the base of the cabinet.
7. Using a wrench, remove both front and back kick plates.
8. Use the forklift or pallet jack to carefully lift the cabinet off the pallet and place it on the floor so that it is resting on its casters.

 **CAUTION**

- The cabinet may roll when resting on its casters. Take proper care to secure the cabinet and ensure the safety of personnel.
- When the leveling feet are up and the cabinet is supported by casters only, do not stand on or in the cabinet. The cabinet may tip, which may result in serious injury. Do not work on or in the cabinet until the leveling feet are in place.

Checking the Accessory Kit

Verify that the following items are included inside the Remote Power Panel (RPP) cabinet:

Note: To open a door, press the key insert to release the handle, turn the handle in either direction and swing the door open.

- This user's guide.
- Key to the lockable doors.

Note: (Optional) After the RPP is installed, you can lock the cabinet with the key to prevent unauthorized entry.

Locating the Cabinet

Follow these guidelines when locating the cabinet after unpacking:

- Place the cabinet on a concrete or other non-combustible surface in a protected area that has adequate airflow, access to a 120V service outlet, and is free of humidity, flammable gas, and corrosion.
- Avoid placing the cabinet on its side.

 **WARNING**

Take adequate precautions, as guided by a qualified structural engineer, when moving or placing this equipment on a raised floor.

To locate the cabinet:

1. Verify that the final location for the cabinet has the following clearances. Check your local codes and regulations for other recommended clearances.

Cabinet Area	Clearance
Front	910 mm (36") for working space and service access
Back	One door: none required if side access is available Two doors: 910 mm (36") for working space and service access
Sides	One door: None required if rear access is available Two doors: 910 mm (36") from one side for service access Quad Feed: 910 mm (36") from one side minimum for service access

2. Verify that the cabinet does not exceed your floor loading capacity. See Table 16 on page 43 for cabinet weight and dimensions.
3. Verify that the location meets the environmental requirements listed in Table 20 on page 44.
4. Plan the cable and conduit access to the cabinet:

Both the top and bottom of the cabinet have entry plates for cable connection. The entry plates are interchangeable and held in place with M5-12 screws. One plate has prepunched knockouts and the other is blank.

To avoid congestion and allow for future load increases, use wire entry points furthest from service access first and work outwards.

Do not run power cables in the vicinity of any control wiring. Leave a minimum of 25.4 mm (1") clearance between the power cable and control wires.

5. Rearrange or remove the entry plates at the top or bottom of the cabinet as needed.
6. Install a cutout in the floor as needed, using the template shown in Figure 2 or Figure 3.
7. Roll the cabinet to its final position, carefully positioning the cabinet over the cutout in the floor.
8. Lower each leveling foot until it makes firm contact with the floor. The cabinet is now stable and in place.

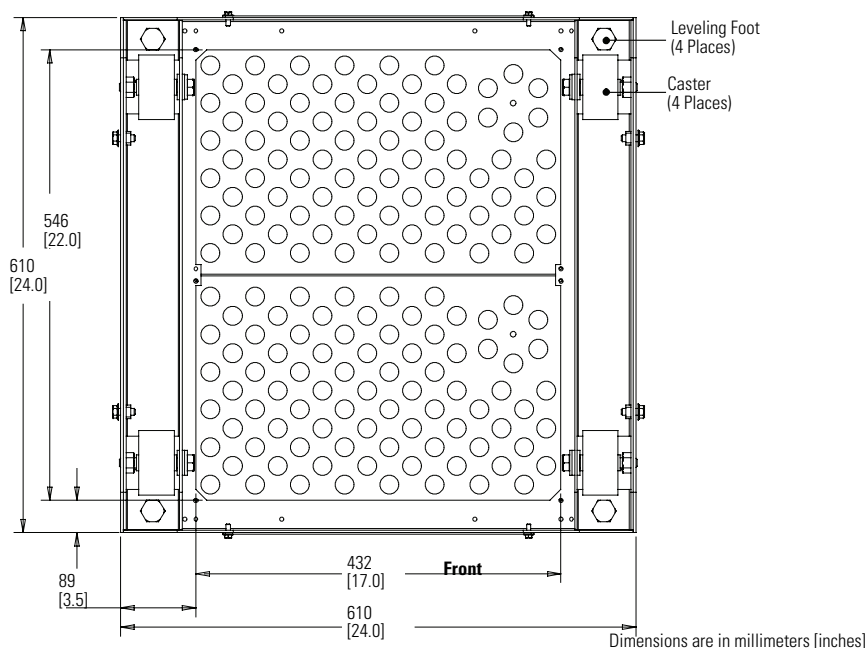


Figure 2. Small RPP Bottom View

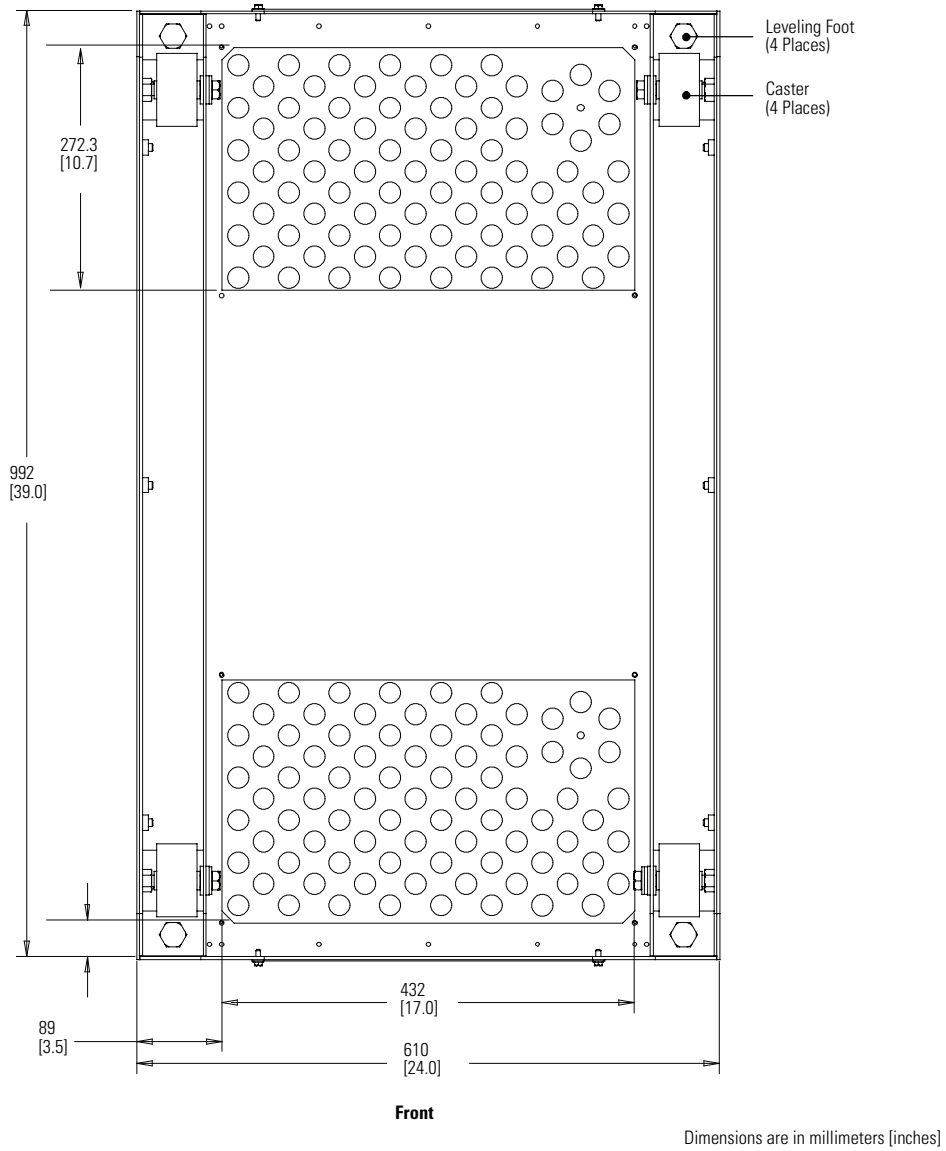


Figure 3. Large RPP Bottom View

Installing the RPP

This section explains wiring installation for the RPP.

Removing the Doors, Side Panels, and Interior Barriers

The RPP has lockable exterior doors, side panels, and interior barriers that protect the panelboard and panelboard breakers. The doors, panels, and barriers can be removed for ease of installation and maintenance.

Note: The number of doors and barriers varies depending on the RPP configuration.

To remove the exterior doors, side panels, and interior barriers before wiring:

1. Open the exterior doors.

To open a door, press the key insert to release the handle, turn the handle in either direction and swing the door open.

2. Remove the exterior doors.

To remove a door, remove its hinge pin and retain. Lift the door off the hinge.

Place the doors in a safe area away from the cabinet to prevent injury or damage to the RPP or personnel. Store the hinge pins in a safe location for later use.

3. Remove the side panels.

Note: Use extra care if removing the side panel next to a Universal Control Board (UCB) to prevent damaging the board.

To remove a side panel, loosen the two captive fasteners at the top of the panel and the two captive fasteners at middle of the panel.

Tilt the panel forward and disconnect the ground strap.

Lift the panel from the opening.

Place the side panels in a safe area away from the cabinet to prevent injury or damage to the RPP or personnel.

4. Remove the interior barrier.

To remove a barrier, push and turn each of the two 1/4-turn fasteners. Swing the barrier open. Squeeze the upper and lower levers on each hinge together (see Figure 4), turn the levers inward, and release and lock them in place.

Disconnect the ground strap near the bottom of the interior barrier and pull the barrier toward you.

Place the barriers in a safe area away from the cabinet to prevent injury or damage to the RPP or personnel.

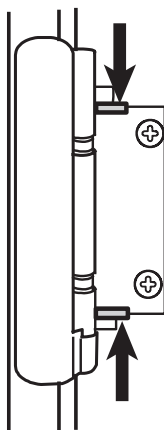


Figure 4. Unfastening an Interior Barrier

Wiring Input and Output Power

 **WARNING**

RISK OF ELECTRIC SHOCK. The electrical enclosure of this unit must be bonded to the Building Grounding Electrode for safe operation. Do not use the isolated ground feature without bonding the RPP enclosure to the Building Grounding Electrode.

As a result of the connected loads high leakage current is possible. Connection to earth ground is required for safety and proper product operation.

Only qualified service personnel (such as a licensed electrician) shall perform the electrical installation. Risk of electrical shock.

Note: Installation of the RPP must comply with the requirements of ANSI/NFPA 75 and National Electric Code® (NEC®) Article 645 when installed within a computer room.

Note: External overcurrent protection and disconnect are not provided by this product, but are required by codes. Refer to Table 2 for feeder breaker and wire sizing requirements.

Note: All wiring must conform to national and local codes. Provide sufficient room for routing all power cables. Route all signal cables separately from power cables.

To wire input and output power to the RPP:

1. Turn off utility power at the distribution point where the RPP will be connected. Be absolutely sure there is no power.
2. Verify that all circuit breakers are in the OFF (O) position. For layout, see Figure 6 on page 12.
3. Connect a dedicated feeder to provide the three-phase input power to the RPP according to Table 1 and Table 2, Table 3, or Table 4. See Figure 7 or Figure 8 starting on page 16 for terminal locations.

Cable routing varies with the selected configuration. Route the input cables to the terminals shown in the following illustrations:

- Single or Dual MLO RPP with a distribution panel on one side (see Figure 7 on page 16)
 - Single MLO RPP with distribution panels on both sides (see Figure 7 on page 16)
 - Direct Connection Configuration RPP (see Figure 8 on page 17)
4. The RPP is provided with an isolated ground from the factory, but ships as a non-isolated configuration.

 **WARNING**

RISK OF ELECTRIC SHOCK. The electrical enclosure of this unit must be bonded to the Building Grounding Electrode for safe operation. Do not use the isolated ground feature without bonding the RPP enclosure to the Building Grounding Electrode.

As a result of the connected loads high leakage current is possible. Connection to earth ground is required for safety and proper product operation.

To use the non-isolated ground configuration, connect your incoming ground to the chassis ground terminal located at the bottom of the unit. See Figure 9 on page 18 or Figure 10 on page 19 for chassis ground terminal location.

To create and use an isolated ground configuration, remove the jumper that connects the input ground terminal to the chassis ground terminal. Connect a ground wire through the ground CT (see Figure 9 on page 18 or Figure 10 on page 19) to the input ground terminal for each input and run a separate wire to the chassis ground terminal located on the bottom of the unit.

Rearrange or remove the entry plates at the top or bottom of the cabinet as needed.

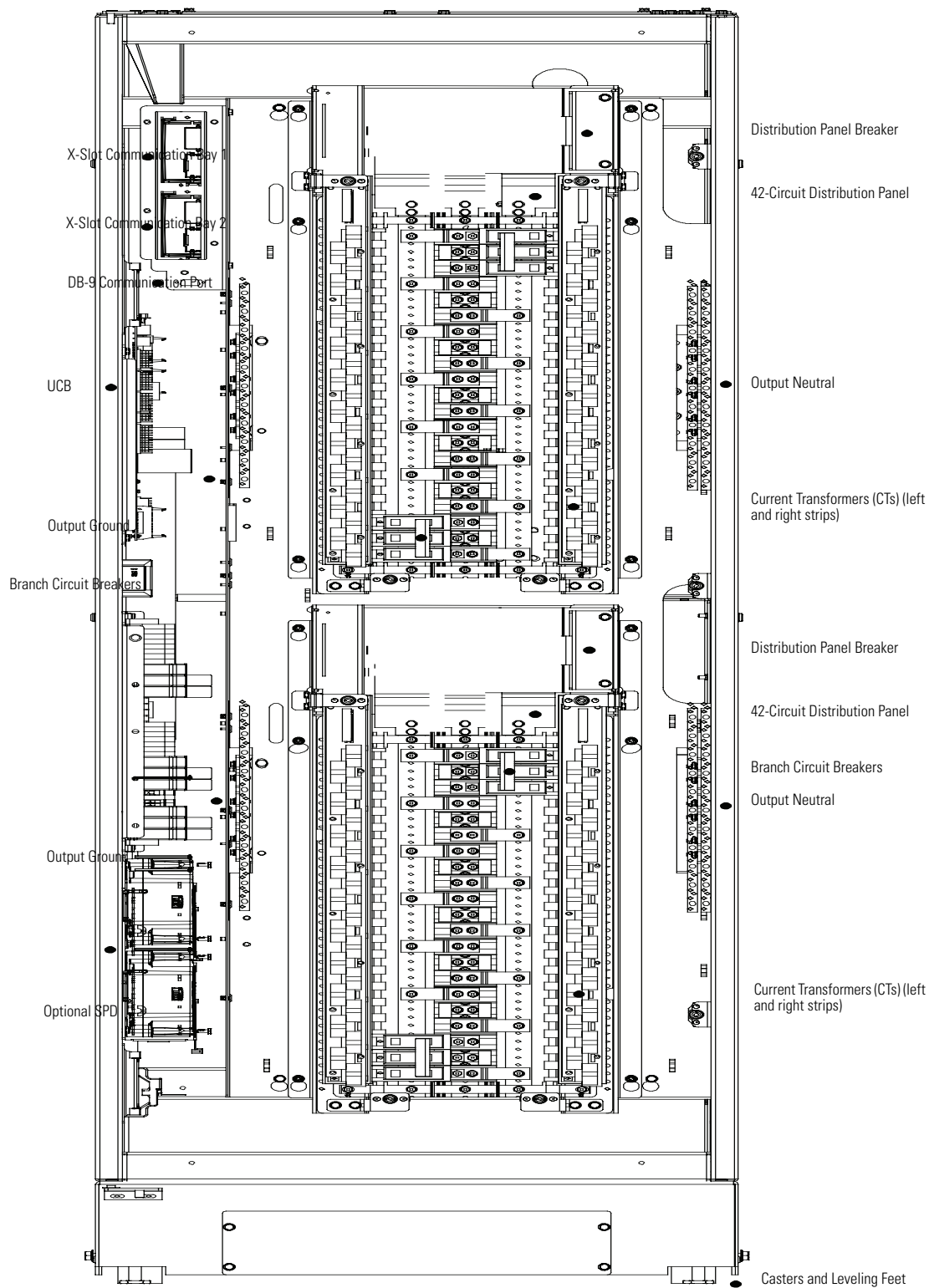


Figure 5. RPP Layout

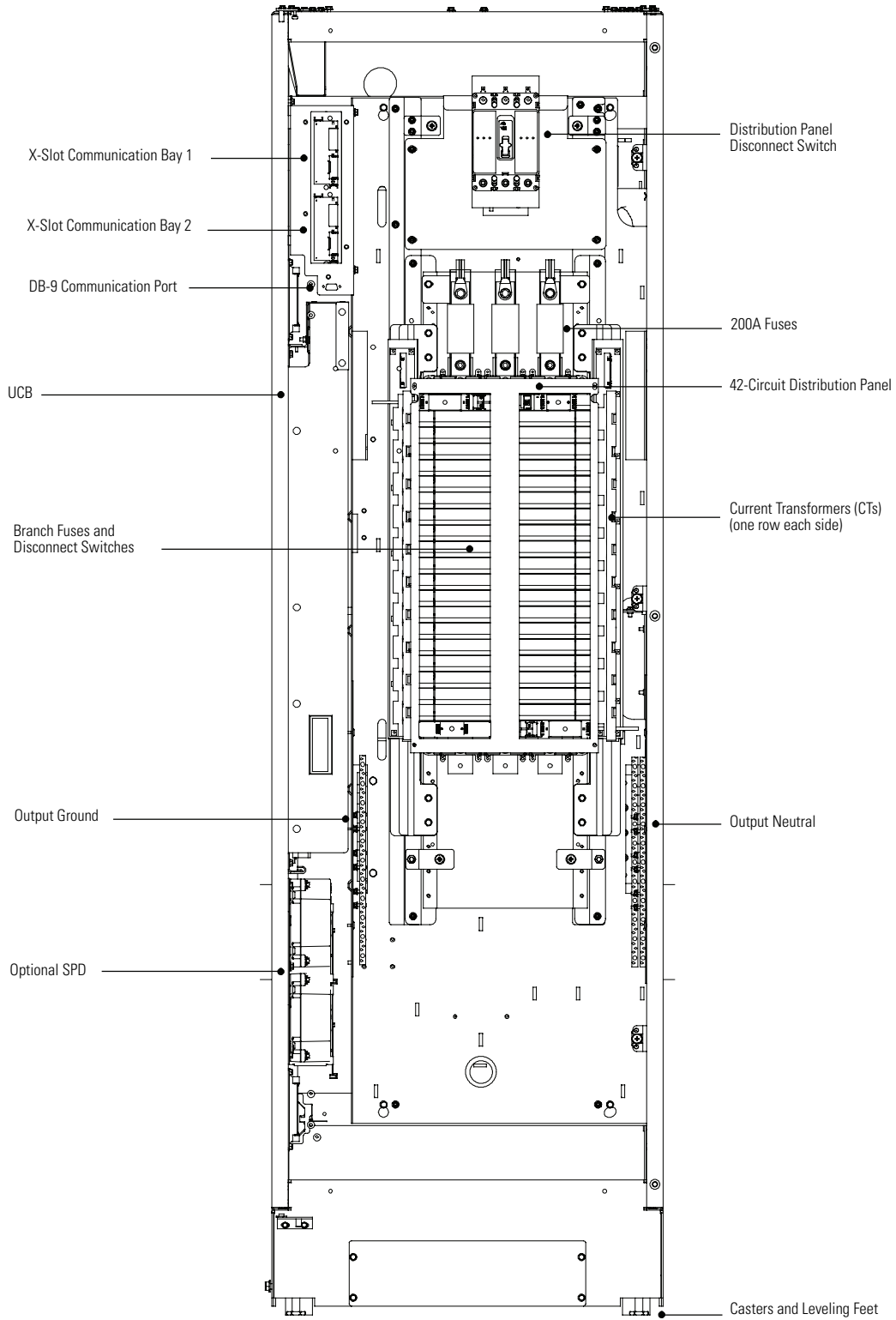


Figure 6. RPP Layout – Cooper Bussmann Panel

Table 1. RPP Main Input Feed Conductor Coding and Termination (208V and 400V)

Configuration and Terminal Functions	Panel Main Breaker or Switch Rating	Terminal	Function	Size of Pressure Termination	Tightening Torque Nm (lb in)
Direct Connection to Panelboard Main Breakers	225AF	A (Black)	Phase A	1 – #6–500MCM	56 (500)
		B (Red)	Phase B	1 – #6–500MCM	56 (500)
		C (Blue)	Phase C	1 – #6–500MCM	56 (500)
		N (White)	Neutral	2 – #6–300MCM	31 (275)
		G (Green)	Ground	1 – #14–1/0	5.6 (50)
Direct Connection to Panelboard Main Breakers	400AF	A (Black)	Phase A	2 – #6–500MCM	56 (500)
		B (Red)	Phase B	2 – #6–500MCM	56 (500)
		C (Blue)	Phase C	2 – #6–500MCM	56 (500)
		N (White)	Neutral	4 – #6–300MCM	31 (275)
		G (Green)	Ground	1 – #14–1/0	5.6 (50)
One Panelboard Single MLO Dual MLO	225AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	2 – #6–300MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
Two Panelboards Single MLO Dual MLO	225AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	4 – #2–600MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
One Panelboard Single MLO Dual MLO	400AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	4 – #2–600MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
Two Panelboards Single MLO Dual MLO	400AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	6 – #2–600MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
Three Panelboards Single MLO	225AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	6 – #2–600MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
Four Panelboards Single MLO	225AF	A (Black)	Phase A	4 – #6–300MCM	31 (275)
		B (Red)	Phase B	4 – #6–300MCM	31 (275)
		C (Blue)	Phase C	4 – #6–300MCM	31 (275)
		N (White)	Neutral	6 – #2–600MCM	56 (500)
		G (Green)	Ground	2 – #14–1/0	5.6 (50)
Isolated Ground (if applicable)	All	G (Green)	Isolated Ground	1 – #6–300MCM	31 (275)

Table 2. Conductor Sizing Load Rating (80% Rated Breakers)

Panel Configuration	Panelboard Current and Voltage Rating	Load Rating	Main Breaker Maximum Input Current	Feeder Breaker	Conductor	Wire Size CSA (AWG) (See NOTE)	Number of Conductors
Direct Connection to Panelboard Main Breakers	225A 208V 400V	80%	180A	225A	Phase A, B, C	85mm ² (3/0)	1
					Neutral	85mm ² (3/0)	2
					Ground	21mm ² (#4)	1
Direct Connection to Panelboard Main Breakers	400A 208V	80%	320A	400A	Phase A, B, C	85mm ² (3/0)	2
					Neutral	85mm ² (3/0)	4
					Ground	27mm ² (#3)	1
One Panelboard Single MLO Dual MLO	225A 208V 400V	80%	180A	225A	Phase A, B, C	85mm ² (3/0)	1
					Neutral	85mm ² (3/0)	2
					Ground	21mm ² (#4)	1
Two Panelboards Single MLO Dual MLO	225A 208V 400V	80%	180A	450A	Phase A, B, C	85mm ² (3/0)	2
					Neutral	85mm ² (3/0)	4
					Ground	34mm ² (1/0)	1
One Panelboard Single MLO Dual MLO	400A 208V	80%	320A	400A	Phase A, B, C	85mm ² (3/0)	2
					Neutral	85mm ² (3/0)	4
					Ground	27mm ² (#3)	1
Two Panelboards Single MLO Dual MLO	400A 208V	80%	320A	800A	Phase A, B, C	85mm ² (3/0)	4
					Neutral	126mm ² (250)	6
					Ground	54mm ² (1/0)	1
Three Panelboards Single MLO	225A 208V 400V	80%	180A	700A	Phase A, B, C	85mm ² (3/0)	3
					Neutral	85mm ² (3/0)	6
					Ground	54mm ² (1/0)	1
Four Panelboards Single MLO	225A 208V 400V	80%	180A	900A	Phase A, B, C	85mm ² (3/0)	4
					Neutral	126mm ² (250)	6
					Ground	34mm ² (1/0)	2

NOTE: Wire sizes are based on NEC 2008 Table 310.16 using 90° copper conductors.

Table 3. Conductor Sizing Load Rating (100% Rated Breakers)

Panel Configuration	Panelboard Current and Voltage Rating	Load Rating	Main Breaker Maximum Input Current	Feeder Breaker	Conductor	Wire Size CSA (AWG or MCM) (See NOTE)	Number of Conductors
Direct Connection to Panelboard Main Breakers	225A 208V 400V	100%	225A	225A	Phase A, B, C	126mm ² (250)	1
					Neutral	126mm ² (250)	2
					Ground	21mm ² (#4)	1
Direct Connection to Panelboard Main Breakers	400A 208V	100%	400A	400A	Phase A, B, C	107mm ² (4/0)	2
					Neutral	107mm ² (4/0)	4
					Ground	27mm ² (#3)	1
One Panelboard Single MLO Dual MLO	225A 208V 400V	100%	225A	225A	Phase A, B, C	126mm ² (250)	1
					Neutral	126mm ² (250)	2
					Ground	21mm ² (#4)	1
Two Panelboards Single MLO Dual MLO	225A 208V 400V	100%	225A	450A	Phase A, B, C	126mm ² (250)	2
					Neutral	126mm ² (250)	4
					Ground	34mm ² (1/0)	1
One Panelboard Single MLO Dual MLO	400A 208V	100%	400A	400A	Phase A, B, C	107mm ² (4/0)	2
					Neutral	107mm ² (4/0)	4
					Ground	27mm ² (#3)	1
Two Panelboards Single MLO Dual MLO	400A 208V	100%	400A	800A	Phase A, B, C	107mm ² (4/0)	4
					Neutral	176mm ² (350)	6
					Ground	54mm ² (1/0)	1
Three Panelboards Single MLO	225A 208V 400V	100%	225A	700A	Phase A, B, C	126mm ² (250)	3
					Neutral	126mm ² (250)	6
					Ground	54mm ² (1/0)	1
Four Panelboards Single MLO	225A 208V 400V	100%	225A	900A	Phase A, B, C	126mm ² (250)	4
					Neutral	201mm ² (400)	6
					Ground	34mm ² (#2)	2

NOTE: Wire sizes are based on NEC 2008 Table 310.16 using 90° copper conductors.

Table 4. Conductor Sizing Load Rating (Cooper Bussmann Panelboard)

Panel Configuration	Panelboard Current and Voltage Rating	Load Rating	Main Breaker Maximum Input Current	Feeder Breaker	Conductor	Wire Size CSA (AWG or MCM) (See NOTE)	Number of Conductors
Direct Connection to Panelboard Main Switches	200A 400V	100%	200A	200A	Phase A, B, C	85mm ² (3/0)	1
					Neutral	85mm ² (3/0)	2
					Ground	21mm ² (#4)	1
One Panelboard Single MLO Dual MLO	200A 400V	100%	200A	200A	Phase A, B, C	85mm ² (3/0)	1
					Neutral	85mm ² (3/0)	2
					Ground	21mm ² (#4)	1
Two Panelboards Single MLO	200A 400V	100%	200A	200A	Phase A, B, C	85mm ² (3/0)	2
					Neutral	85mm ² (3/0)	4
					Ground	21mm ² (#4)	1

NOTE: Wire sizes are based on NEC 2008 Table 310.16 using 90° copper conductors.

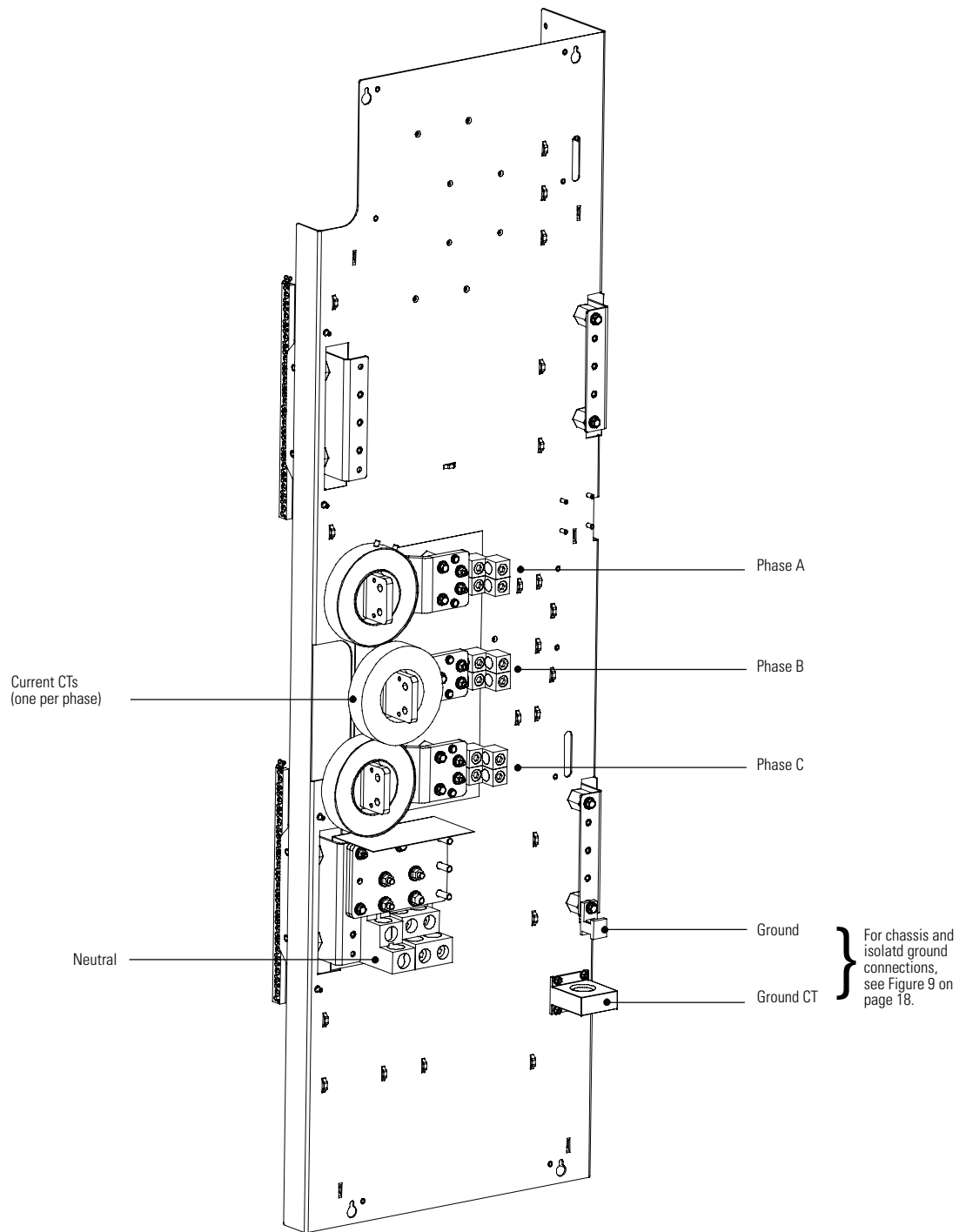


Figure 7. Wiring the Input Connections (each side) for Single or Dual MLO RPP

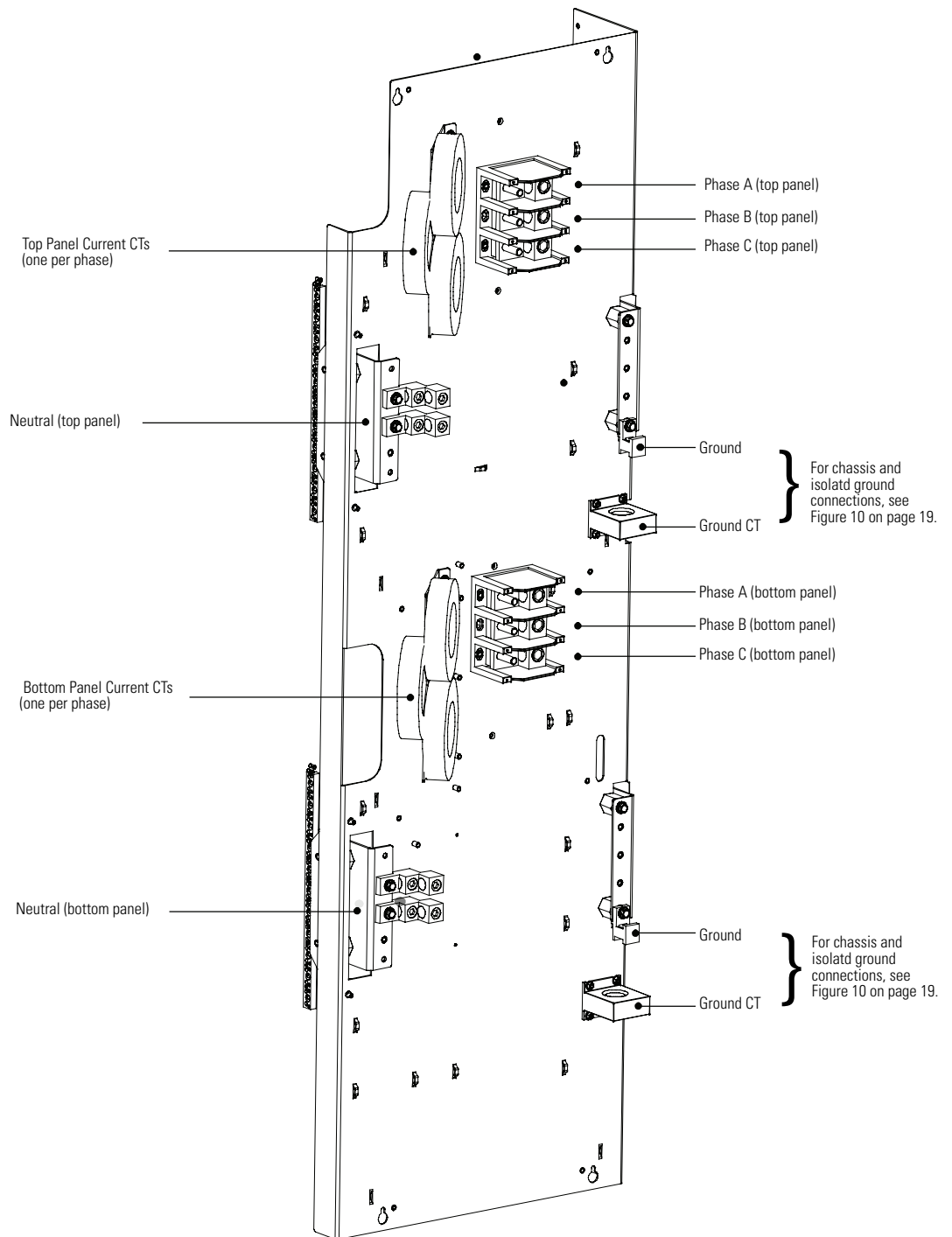
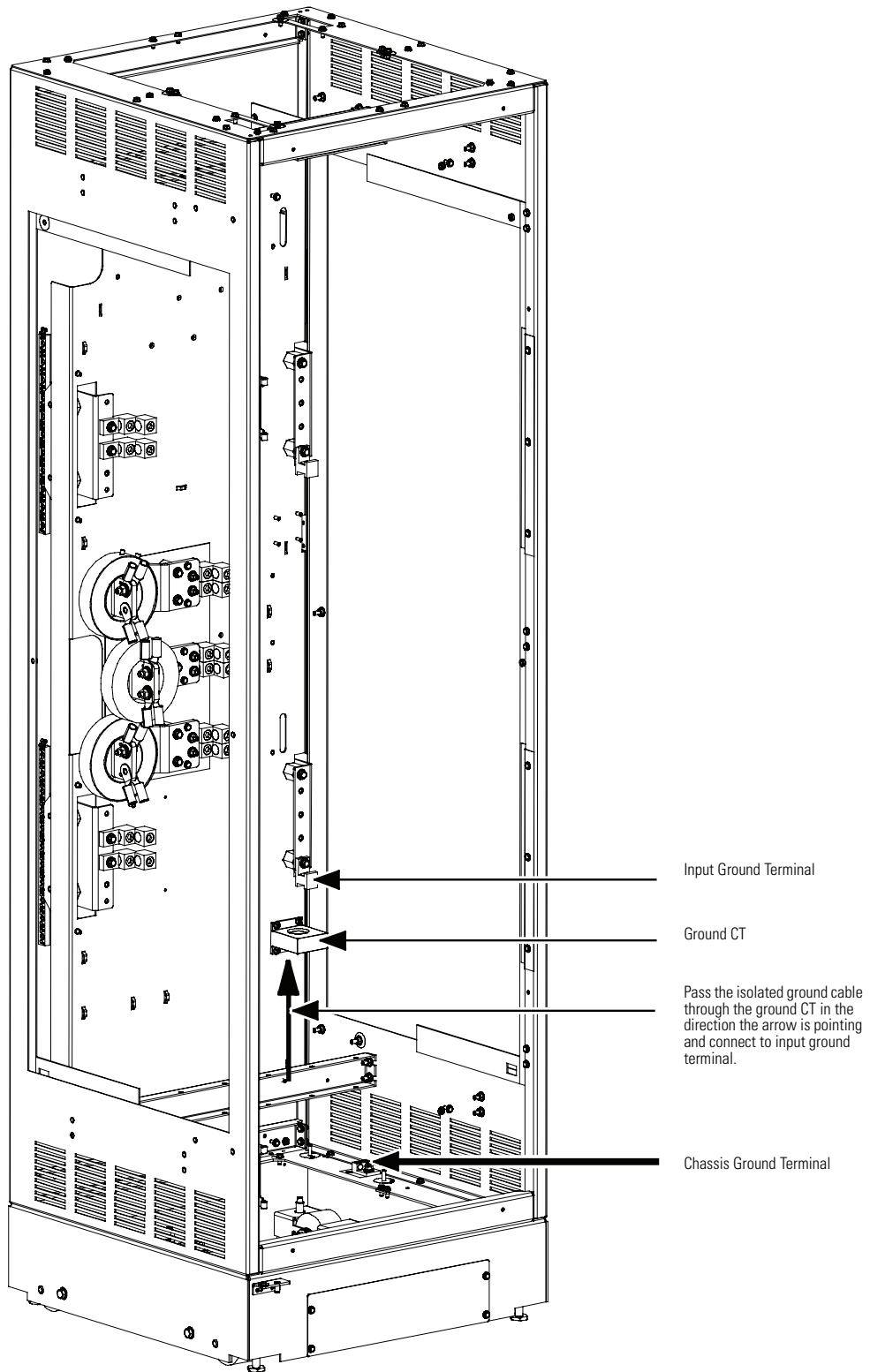
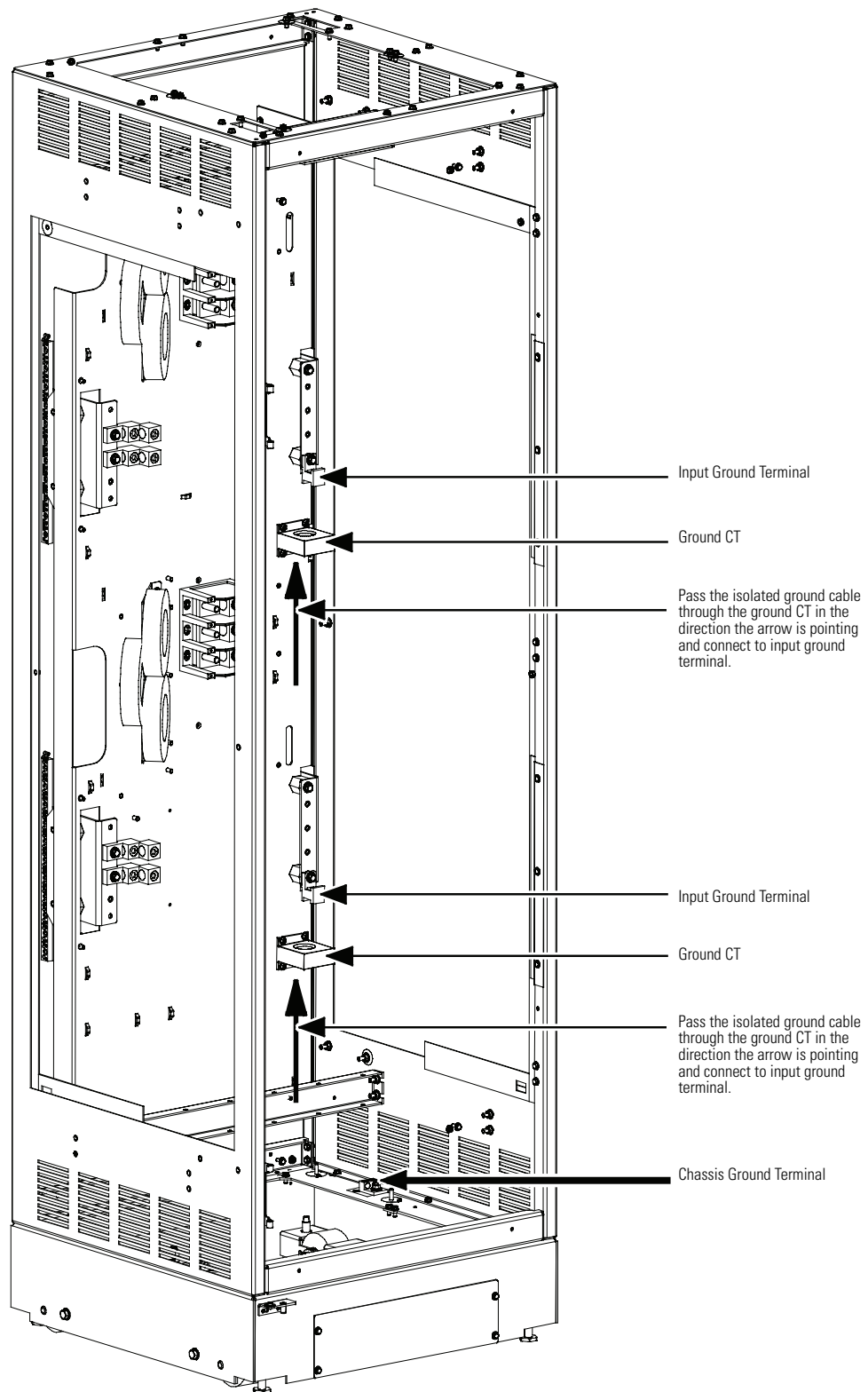


Figure 8. Wiring Input Connections (each side) for Direct Connect RPP



Note: Small RPP shown. Connections are the same for the Large RPP

Figure 9. Isolated Ground Connections (each side) for Single or Dual MLO RPP



Note: Small RPP shown. Connections are the same for the Large RPP

Figure 10. Isolated Ground Connections (each side) for Direct Connect RPP

5. Connect the output power to the 42-pole circuit breaker panelboards according to the branch circuit breaker manufacturer's ratings and instructions, (see Figure 12 or Figure 13, and Table 5). For each pole, install the customer-supplied branch circuit breaker and wire the breaker, ground, and neutral wires. Balance the loads.

Compatible branch circuit breakers:

- Cutler-Hammer bolt-on type 208V panelboard – BAB or QBHW 10-125A bolt-on breakers
- Cutler-Hammer plug-on type 208V panelboard – HQP or QPHW 10-125A plug-on breakers
- Cutler-Hammer bolt-on type 400V panelboard – GHB 15-100A bolt-on breakers
- Square-D bolt-on type 208V panelboard – QOB 20-100A bolt-on breakers
- Cooper Bussmann bolt-on disconnects with Indicating or non-indicating CUBEFuses

Note: To use 100A breakers with EMS Premium metering, the optional 100A CT strips must be installed.

Note: EMS Premium metering for Square-D branch circuit breakers is available up to 60A.

Note: All connections must comply with NEC and other applicable codes.

Note: When installing or replacing branch breakers, use only hand tools and follow torque specifications. See Table 6. Failure to follow torque specifications may result in damage to bus bar or branch breaker.

Note: If you are installing the optional EMS Premium metering, route branch wiring through the current transformer (CT) opposite the breaker terminal to the breaker lug. Use care when bending and routing the wires through the CTs. See Figure 11.

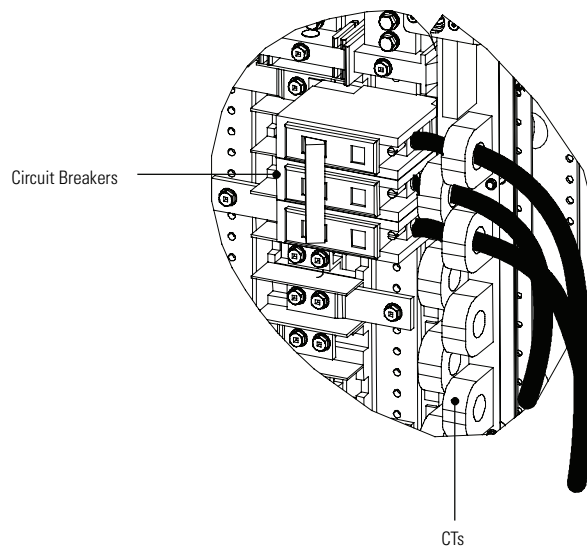


Figure 11. Wiring the CTs (for EMS Premium Metering Only)

Table 5. Torque Specifications

Panelboard and Subfeed Breakers						
Number of Wires	Wire Size	Branch Breakers	Slotted Head Screw Slot Length		Socket Head Screw Socket Size	
			Over 1/4"	1/4" and less	3/16"	5/32"
1	2.1 5.3 mm ² (14 10 AWG)	2.3 Nm (20 lb in)	4.0 Nm (35 lb in)	2.3 Nm (20 lb in)	–	–
1	8.4 mm ² (8 AWG)	2.8 Nm (25 lb in)	4.5 Nm (40 lb in)	2.8 Nm (25 lb in)	–	–
1	13.3 18.0 mm ² (6 4 AWG)	3.1 Nm (27 lb in)	5.1 Nm (45 lb in)	4.0 Nm (35 lb in)	13.6 Nm (120 lb in)	11.3 Nm (100 lb in)
1	26.7 mm ² (3 AWG)	5.1 Nm (45 lb in)	5.6 Nm (50 lb in)	4.0 Nm (35 lb in)	13.6 Nm (120 lb in)	11.3 Nm (100 lb in)
1	33.6 mm ² (2 AWG)	5.1 Nm (45 lb in)	5.6 Nm (50 lb in)	4.5 Nm (40 lb in)	13.6 Nm (120 lb in)	11.3 Nm (100 lb in)
1	42.3 53.4 mm ² (1 1/0 AWG)	5.1 Nm (45 lb in)	5.6 Nm (50 lb in)	–	13.6 Nm (120 lb in)	11.3 Nm (100 lb in)
1	67.3 107.0 mm ² (2/0 4/0 AWG)	–	5.6 Nm (50 lb in)	–	13.6 Nm (120 lb in)	11.3 Nm (100 lb in)

Table 6. Branch Breaker Wire Torques

Connecting Wire Torques								Bus Bar Connections	
Neutral & Ground Bar				Other Terminals				Bolt Size	Torque Nm (lb in)
Small Opening		Large Opening		Screwdriver		Socket Head		#10	3.4 Nm (30 lb in)
Wire Size	Torque Nm (lb in)	Wire Size	Torque Nm (lb in)	Wire Size	Torque Nm (lb in)	Across Flats	Torque Nm (lb in)	1/4"	7.4 Nm (65 lb in)
2.1 3.3 mm ² (14 12 AWG)	2.3 Nm (20 lb in)*	2.1 5.3 mm ² (14 10 AWG)	4.0 Nm (35 lb in)**	0.8 5.3 mm ² (18 10 AWG)	4.0 Nm (35 lb in)	1/8"	5.1 Nm (45 lb in)	–	Torque Nm (lb ft)
5.3 mm ² (10 AWG)	2.3 Nm (20 lb in)	8.4 mm ² (8 AWG)	4.5 Nm (40 lb in)	8.4 mm ² (8 AWG)	4.5 Nm (40 lb in)	5/32"	11.3 Nm (100 lb in)	5/16"	14.6 Nm (10.8 lb ft)
8.4 mm ² (8 AWG)	2.8 Nm (25 lb in)	18.0 13.3 mm ² (4 6 AWG)	5.1 Nm (45 lb in)	13.3 18.0 mm ² (6 4 AWG)	5.1 Nm (45 lb in)	3/16"	13.6 Nm (120 lb in)	3/8"	27.1 Nm (20 lb ft)
13.3 mm ² (6 AWG)	4.0 Nm (35 lb in)	26.7 53.4 mm ² (3 1/0 AWG)	5.6 Nm (50 lb in)	33.6 67.3 mm ² (2 2/0 AWG)	5.6 Nm (50 lb in)	7/32"	16.9 Nm (150 lb in)	1/2"	67.8 Nm (50 lb ft)
*Max 2 wires						1/4"	22.6 Nm (200 lb in)		
** Max 3 wires						5/16"	31.1 Nm (275 lb in)		
						3/8"	42.4 Nm (375 lb in)		
						1/2"	56.5 Nm (500 lb in)		
						9/16"	67.8 Nm (600 lb in)		

NOTE: Use 50 lb in for 3-#10 conductors.

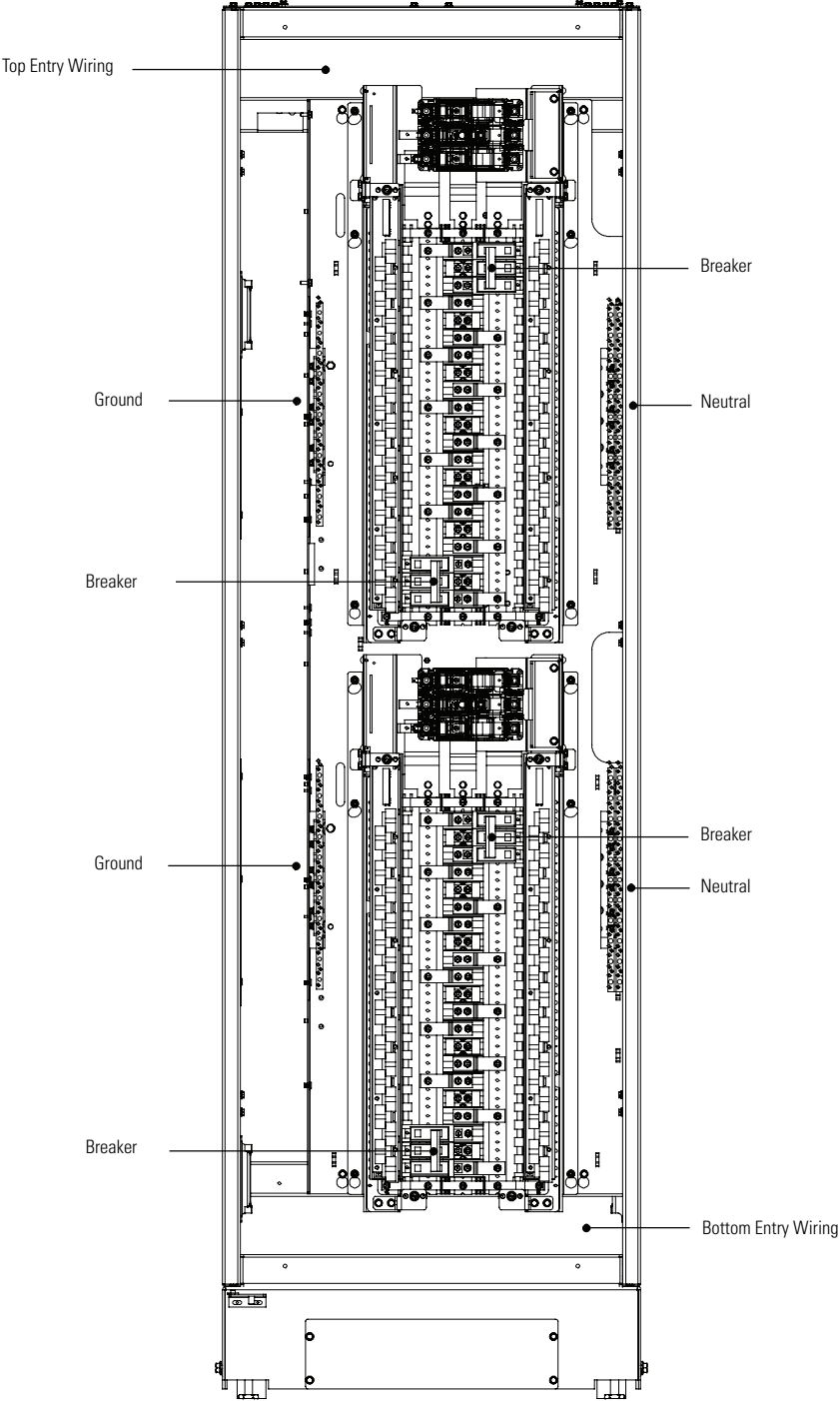


Figure 12. Wiring the Output Connections (each side)

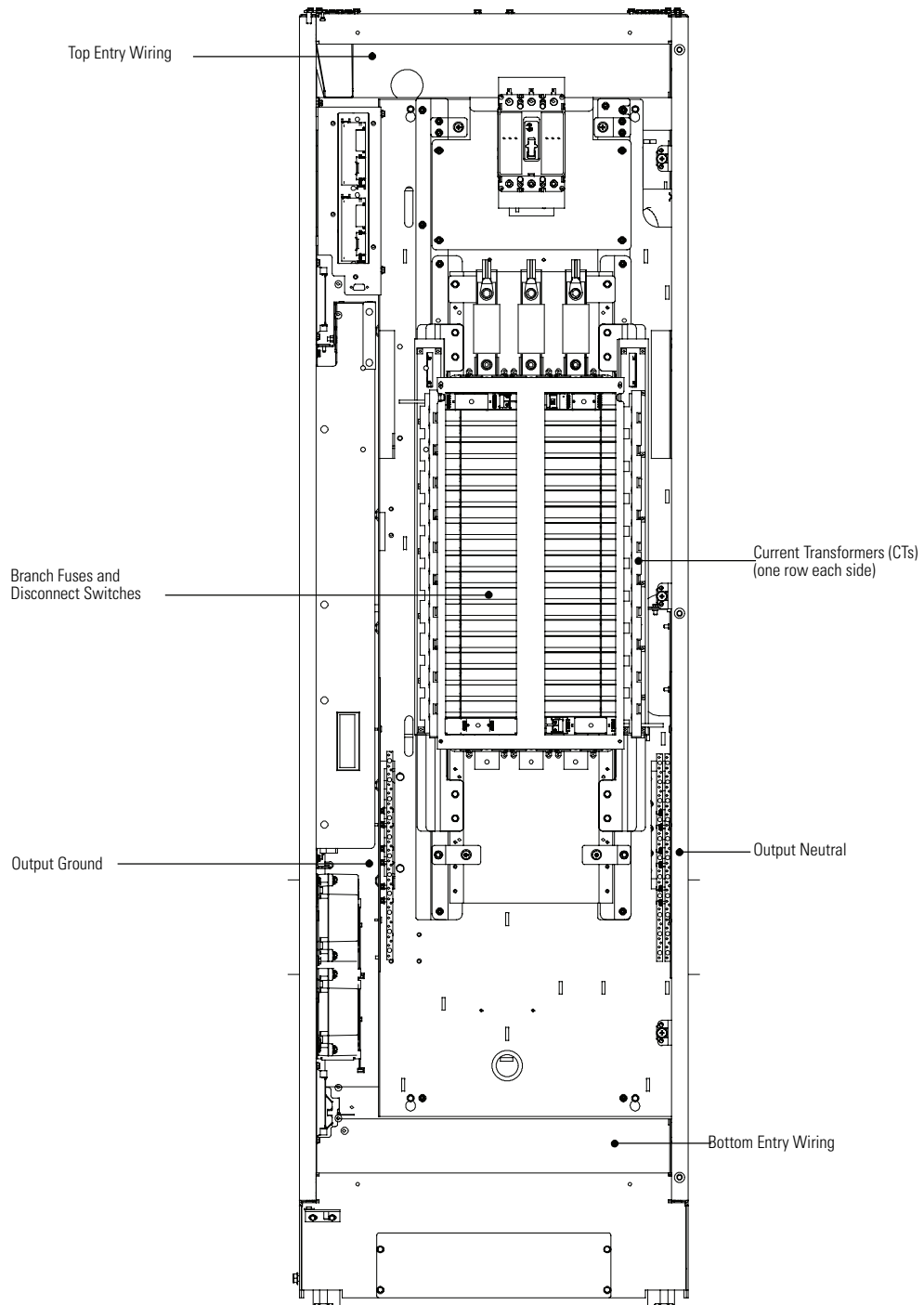


Figure 13. Wiring the Output Connections – Cooper Bussmann Panel (each side)

Shunt Trip and Auxiliary Contact Interface Connections

Note: When installing shunt trip and auxiliary contact wiring to the RPP interface terminals, conduit must be installed between the device and the RPP. Install the control wiring in separate conduit from the power wiring.

To wire the terminals:

1. Verify that the RPP is turned off and all power sources are removed.
2. Route the RPP interface wiring through either the top or bottom of the cabinet to the RPP interface terminals. See Figure 14 for wiring access and terminal locations.
3. Connect the wiring. See Figure 15 for terminal assignments and Table 7 for termination requirements.

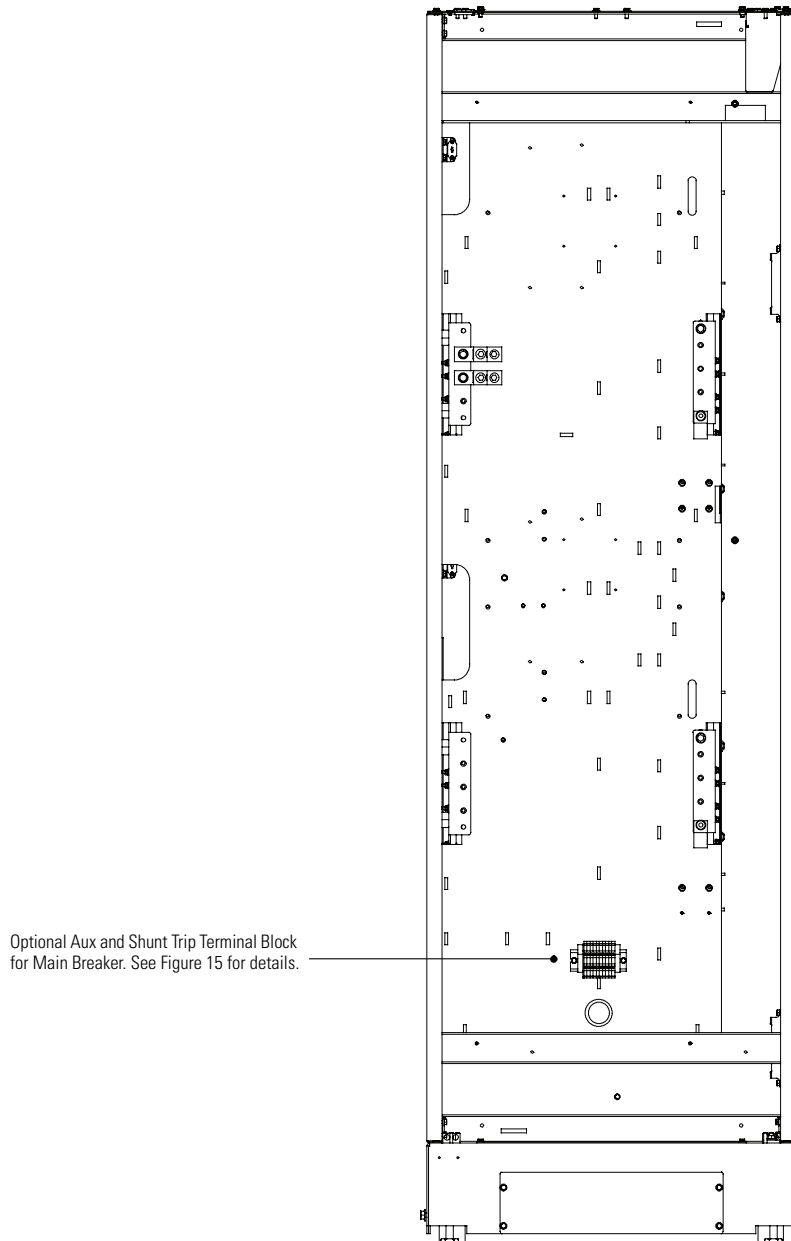
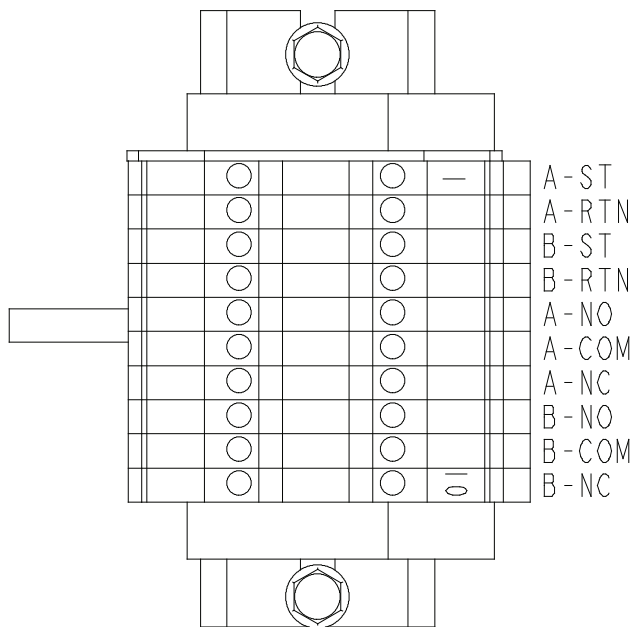


Figure 14. Shunt Trip and Auxiliary Contact Terminal Location (each side)



(Rotated for Clarity)

NOTE Letter A in the terminal designation indicates the top panelboard main breaker and letter B in the terminal designation indicates the bottom panelboard main breaker

Figure 15. Shunt Trip and Auxiliary Contact Terminal Detail

Table 7. Shunt Trip and Auxiliary Contact Terminal Block Terminations

Terminal Function	Rating	Size of Pressure Termination	Tightening Torque Nm (lb in)	Type Screw	Comments
Auxiliary Contacts or Shunt Trip	600V, 20A	#26-#12	0.4 (3.5) - 0.8 (7.1)	Slotted	Use twisted-pair wires for each input and return or common. Strip wire insulation back 10 millimeters to wire terminal blocks.

Initial Startup

⚠ WARNING

Only qualified service personnel (such as a licensed electrician) shall perform the initial startup. Risk of electrical shock.

To start up the RPP:

1. Turn off utility power at the distribution point where the RPP will be connected. Be absolutely sure there is no power.
2. Verify that all circuit breakers are in the OFF (O) position. For layout, see Figure 6 on page 12.
3. Remove any foreign objects from the interior of the unit.

Note: Verify that intake and exhaust air screens are clean and free of obstruction.

4. Complete the installation checklist (see 27).
5. Turn on utility power to the RPP.

6. EMS option only. Verify that the display activates after approximately 30 seconds.
7. Check the phase rotation at the panelboard input breaker(s). Phase rotation should be A, B, C, left to right.
8. Verify and record the input voltages on the panelboard circuit breaker(s) in Table 8.

Note: If the input voltage is incorrect, check for wiring errors or improper transformer tap.

Table 8. Panelboard Circuit Breaker Input Voltages at Startup

Breaker	Phase Voltages					
	A-B	B-C	C-A	A-N	B-N	C-N
1						
2						
3						
4						

9. Turn on the panelboard circuit breaker(s).
If the breaker trips within one minute, contact your Eaton service representative for assistance.
Note: The control circuit is energized when the panelboard breaker is tripped or off.
10. EMS option only. Verify that the On indicator is illuminated.
11. Check the phase rotation at the line side of the terminals of the panelboard breaker(s) and any subfeed circuit breakers.
The rotation should be A, B, C, top to bottom. Note that the panelboard and subfeed breakers are rotated 90° counter-clockwise.
12. EMS option only. Set the options recommended in “Initial Configuration” on page 33.
13. Turn on the individual panelboard circuit breakers following the startup sequence recommended by the load equipment manufacturer.

Replacing the Interior Barriers, Side Panels, and Doors

Note: The interior barriers must be replaced, the ground straps reconnected, and the side panels and exterior doors replaced prior to placing the RPP in service.

To replace the interior barriers, side panels, and exterior doors:

1. Replace each interior barrier removed:
Place the barrier's movable hinge into the stationary hinge on the cabinet and squeeze the upper and lower levers together (see Figure 4 on page 9). Turn the levers outward, then release the levers. The hinge pins should spring into position, locking the barrier to the cabinet.
2. Reconnect the ground strap to each interior barrier.
3. Replace the side panels.

Note: Use extra care if installing the side panel next to a UCB to prevent damaging the board.

Reinstall the eight screws along the sides of the panel. Tighten the two bolts at the top of the panel.

4. Replace the exterior doors.
Place each door on its hinge. Replace each door's hinge pin.
5. Close the doors.
6. (Optional) Lock the doors using the supplied key.

Completing the Installation Checklist

This checklist ensures that you have completely installed all hardware, cables, and other equipment. Completing all items listed on the checklist will help ensure a smooth installation. Make a copy of the installation checklist before filling it out, and retain the original.

Note: The installation checklist MUST be completed prior to starting the RPP for the first time.

Installation Checklist

- All packing materials and restraints have been removed.
- The RPP is placed in its installed location and all doors, side panels, and interior barriers are installed and secure.
- All conduits and cables are properly routed to the RPP.
- All power cables are properly sized and terminated.
- Branch circuit breakers are installed and wired to load.
- Cooper Bussmann disconnects and fuses are installed and wired to load.
- Input power connections are properly installed, including ground conductors.
- Neutral conductors are installed or bonded to ground.
- No foreign objects are inside the cabinet.
- LAN and telephone drops are installed, and LAN and telephone connections have been completed. (Optional)
- Alarm relays and building alarms are wired appropriately. (Optional)
- Air conditioning equipment is installed and operating correctly.
- The area around the installed RPP is clean and dust-free. (The RPP must be installed on a level floor suitable for computer or electronic equipment.)
- Adequate workspace exists around the RPP.
- Adequate lighting is provided around the RPP.
- A 120V service outlet is located within 7.5m (25 ft) of the RPP.

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Chapter 4 Operation

This chapter describes how to use the Eaton Remote Power Panel (RPP), including front panel operation, initial configuration, and startup and shutdown.

Control Panel Functions

The RPP with the Energy Management System (EMS) option has a five-button graphical LCD with backlight (see Figure 16). Depending on the level of meter installed, the display provides useful information about the RPP itself, events, measurements, and settings.

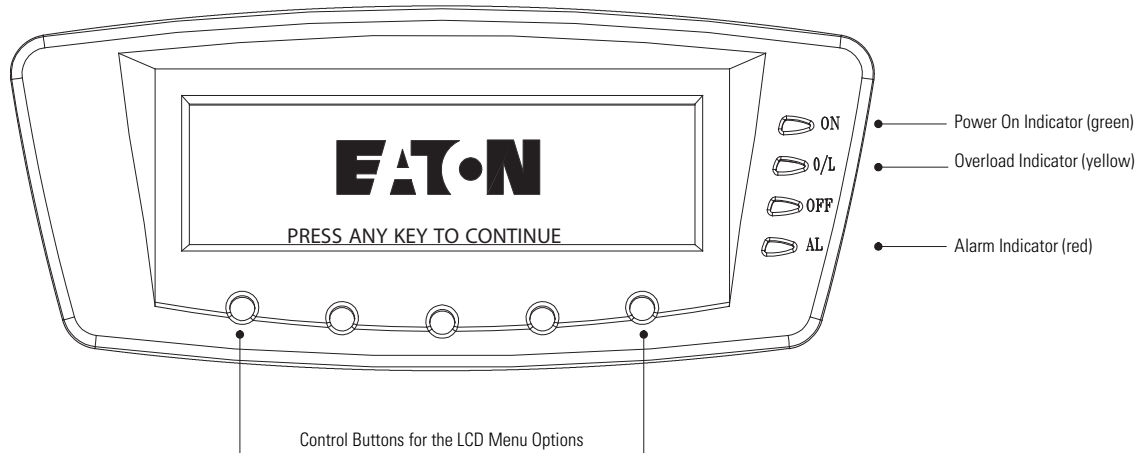


Figure 16. EMS Meter Display

The following table shows the indicator status and description.

Indicator	Status	Description
ON Green	On Off	The RPP is operating normally. The RPP is turned off and will not turn on automatically.
O/L Yellow	On	One or more phase is in overload; or there is an alarm or warning for neutral overload, ground overload, main panel breaker overload, or panel breaker overload; or there is a transformer overload.
OFF Yellow	On	The EMS-RPP is de-energized or output voltage is less than 25% of nominal.
AL Red	Flashing On	There is a new RPP alarm condition. See “Troubleshooting” on page 45 for additional information. To acknowledge the alarm and silence the horn, press any button. An acknowledged alarm condition exists.

EMS Meter Levels

The following table shows the two EMS meter levels and their features.

Feature	System Level Meter	Premium Meter
System-level input and output meters	X	X
Active events	X	X
History log	X	X
Setup menu	X	X
Mimic screen	X	X
Profile log	X	X
Branch circuit monitoring		X

Display Functions

The LCD displays the Eaton logo. Press any button to activate the mimic screen and menu options (see Figure 17). The mimic screen shows a real-time graphical representation of the operating status of the system. At the top of the screen, an information line cycles through displays of the date and time, and any active alarms or events.

To select a menu option, press the button below the option label. When available:

- Use the ↑ and ↓ buttons to scroll through a listing of information.
- Use the ← and → buttons to select another item on the screen to view or change.
- Press the ↶ button to return to the previous menu.

The backlit LCD automatically dims after a long period of inactivity. Press any button to restore the screen.

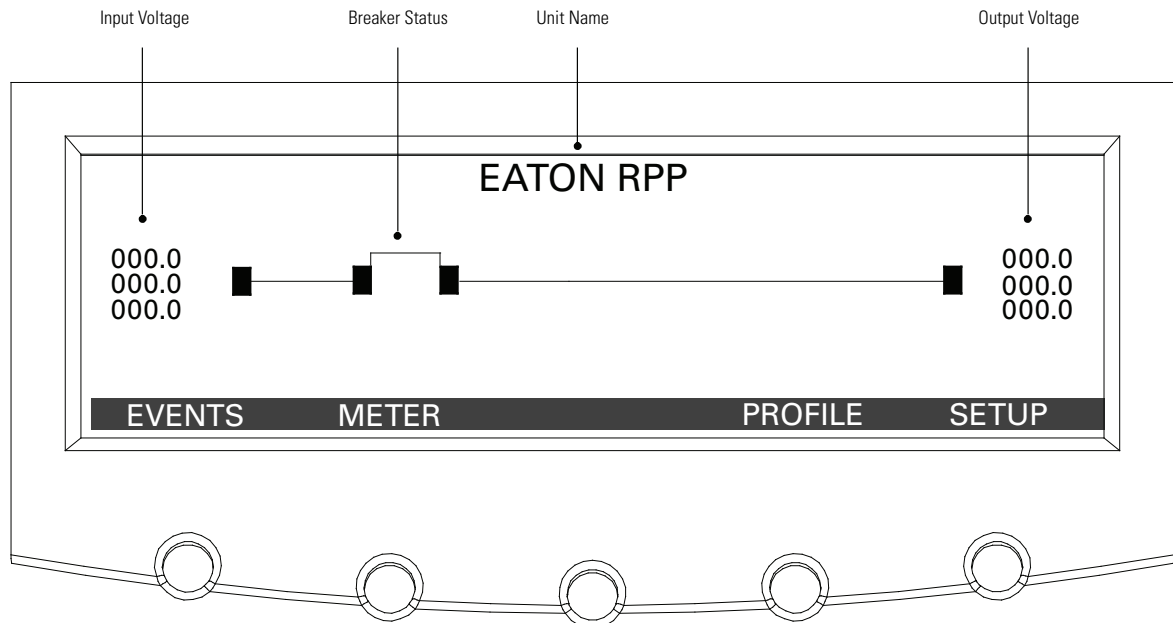


Figure 17. Mimic Screen and Main Menu (EMS System Level Meter Screen Shown)

The following tables show the basic menu structure.

Table 9. Menu Map for Display Functions

Main Menu	Submenu	Display Information or Menu Function
Events	Active Events	Displays list of active system events. As events clear, they are removed from the list.
	History	Displays historical log of system events. The log stores the most recent 127 events and alarms.
Meter	Output	Displays output performance meters for the system or critical load (see Table 10 for detail): RMS / % / THD / Crest / KWH
	Input	Displays input performance meters for the system or critical load (see Table 11 for detail): RMS / % / THD / Crest / KWH
Profile (System Level and Premium Meters)		Displays load profile data for the most recent 24 months. Profile data includes highest and lowest input and output currents, frequencies, power levels, power factors, AC undervoltage, and Total Harmonic Distortion (THD), and exact time each reading occurred. Current month's profile reflects real-time values.
Setup		See Table 12 for detail.

Table 10. Output Meters

Screen	Meters Displayed
Output RMS (two screens)	Total output voltage line-to-line (V1–2, V2 –3, V3–1) Total output voltage line-to-neutral (V1, V2, V3) Output current for each phase (I1, I2, I3)* Output frequency (Hz) Output kVA (KVA)* Output KW (KW)* Output power factor (PF)*
Output %	Ratio (in percent) of present output voltage compared to nominal (V1, V2, V3, I1*, I2*, I3*)
Output THD	Ratio (in tenth percent) of the distortion present on the output in the form of harmonics and noise compared to fundamental pure sine wave (utility frequency) (V1, V2, V3, I1*, I2*, I3*)
Output Crest*	Ratio (in percent) of the peak to RMS of the output currents (I1, I2, I3)
Output KWH*	Total power (KWH/m, KWH/y, KWht)

* Available only if optional current transformers (CTs) are installed (EMS Premium metering only).

Table 11. Input Meters

Screen	Meters Displayed
Input RMS (two screens)	Total input voltage line-to-line (V1–2, V2–3, V3–1) Total input voltage line-to-neutral (V1, V2, V3) Input current for each phase (I1, I2, I3) Input frequency (Hz) Input kVA (KVA) Input kW (KW) Input power factor (PF) Input neutral (In) Input ground (Ig)
Input %	Ratio (in percent) of present input voltage compared to nominal (V1, V2, V3, KW, I1, I2, I3)
Input THD	Ratio (in tenth percent) of the distortion present on the input in the form of harmonics and noise compared to fundamental pure sine wave (utility frequency) (V1, V2, V3, I1, I2, I3)
Input Crest	Ratio (in percent) of the peak to RMS of the input currents (I1, I2, I3)
Input KWH	Total power (KWH/m, KWH/y, KWht)

Setup Options

The following table displays the options that can be changed by the user.

Access to setup options is restricted to three System Setup Levels: 0, 1, or 2. The higher the level, the more setup options are available. Options on System Setup Level 0 do not require password access.

Table 12. Setup Options

Minimum Level*	Description	Available Settings	Default Setting
0	Enter Password	Use the arrow keys to enter the password for the level you want to access, then select DONE to display the options for the setup level.	Level 1: L1 Level 2: Contact your service representative
0	Versions	Read only	Current firmware versions installed
0	Contrast Adjust	Adjust screen contrast with left/right arrow buttons	10%
1	Log Out	Exit the Level 1 or Level 2 setup options and display the Level 0 setup options	None
1	Change Access Level Password	Change the password for the current setup level Use the arrow keys to enter the new password (A–Z, 0–9, blank), then select DONE to save the new password.	None
1	Set Date and Time	Set Month, Date, Year (mm/dd/yyyy) Set Hour, Minute (Time is a 24-hour clock.)	00/00/0000 00:00
1	Clear History	Clear the History Log	None
1	Clear Load Profile	Clear the Load Profile	None
1	Building Alarm Setup	For Building Alarm 1 through Building Alarm 4: Name String [up to 19 characters (A–Z, 0–9, –, blank)] Settings: Contact Normally Open or Closed Building Alarm Type (REPO, EPO, SPD, Custom) Notice Level (Log and Alarm options) Enabled/Disabled	BUILDING ALARM [X] Open 1 and 2: Custom; 3: REPO; 4: EPO Log Only Enabled
1	THD Alarm Level	Set the voltage and current Total Harmonic Distortion, and enable or disable this feature: THD settings Enabled/Disabled	5.0 Disabled
2	Unit Type	Read only: Model / CTO / Serial	Factory-set identifiers
2	Unit Name	Up to 19 characters (A–Z, 0–9, blank)	EATON RPP
2	Reset All Lower Level Passwords	Reset the System Setup Level 1 password to the default setting	None

* Minimum System Setup Level required to access the setup option.

Initial Configuration

Perform the initial configuration according to your installed meter option.

EMS System Level Metering

It is recommended to set the following options:

- Date and time
- Screen contrast
- Building alarms

To use the setup menu, see “Setup Options” on page 32.

EMS Premium Metering

Perform the initial configuration for EMS System Level meters. Refer to the user's guide for instructions specific to the EMSEMS Premium metering option.

Startup and Shutdown

Startup

To start the RPP (with the EMS option installed):

1. Open the exterior doors.
To open a door, press the key insert to release the handle, turn the handle in either direction and swing the door open.
2. Verify that all circuit breakers are in the OFF (O) position.
3. Turn on utility power to the RPP.
4. Verify that the display activates after approximately 30 seconds, indicating logic power.
5. Turn on the panelboard circuit breakers.
6. Verify that the Off and Alarm indicators are off and the On indicator is illuminated.
7. Turn on the individual panelboard circuit breakers following the startup sequence recommended by the load equipment manufacturer.
8. Close the exterior doors.

To start the RPP (without the EMS option installed):

1. Open the exterior doors. To open a door, press the key insert to release the handle, turn the handle in either either direction and swing the door open.
To open a door, press the key insert to release the handle, turn the handle in either direction and swing the door open.
2. Verify that all circuit breakers are in the OFF (O) position.
3. Turn on utility power to the RPP.
4. Turn on the panelboard circuit breakers.
5. Turn on the individual panelboard circuit breakers following the startup sequence recommended by the load equipment manufacturer.
6. Close the exterior doors.

Shutdown

To shut down the RPP:

1. Shut down the load equipment according to the manufacturer's recommended shutdown sequence.
Load equipment may be turned off at the equipment or at the circuit breakers on the RPP.
2. Turn off all the panelboard circuit breakers.
3. To remove power from the RPP completely, turn off utility power to the RPP.

Surge Protective Device Option

The optional Surge Protective Device (SPD) is shown in Figure 18. Depending on the configuration of the RPP, the status of SPD is reported either through the three indicators on the unit or through the normally-open contact monitored by Eaton Energy Management System (EMS). For the location of the SPD, see Figure 6 on page 12. For specification details, see Table 21 on page 44.

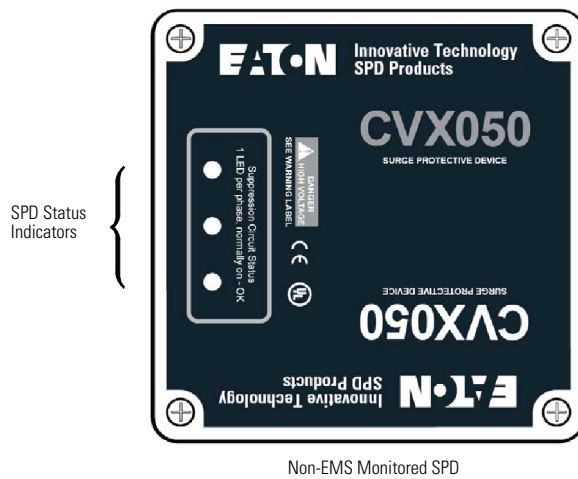


Figure 18. Phase Status Indicators on a Non-EMS Monitored SPD

⚠ WARNING

DO NOT use the SPD Phase Status LED as an indication of the presence or absence of system phase voltages.

After system power has been applied, the SPD automatically begins to protect down-stream electrical devices from damaging voltage transients. With all phase voltages present, if an LED turns OFF (for Non-EMS monitored model), or if the SPD alarm is issued on the EMS display (for EMS monitored model), the SPD has disconnected itself from that phase of the electrical system because one of its Thermally Protected Metal Oxide Varistors (TPMOVs) has failed. If a TPMOV fails, power will be maintained to the load; however, the load is now unprotected. The SPD is not repairable and contains no user serviceable parts. If the SPD fails, the unit must be replaced. Please contact service from Eaton to schedule for a replacement.

Chapter 5 Communication

Communication features are available only with the Energy Management System (EMS) System Level and Premium metering.

This section describes the:

- DB-9 communication port
- X-Slot cards
- Relay output contacts
- Programmable signal inputs

Figure 19 shows the location of the communication options and control terminals on the Remote Power Panel (RPP).

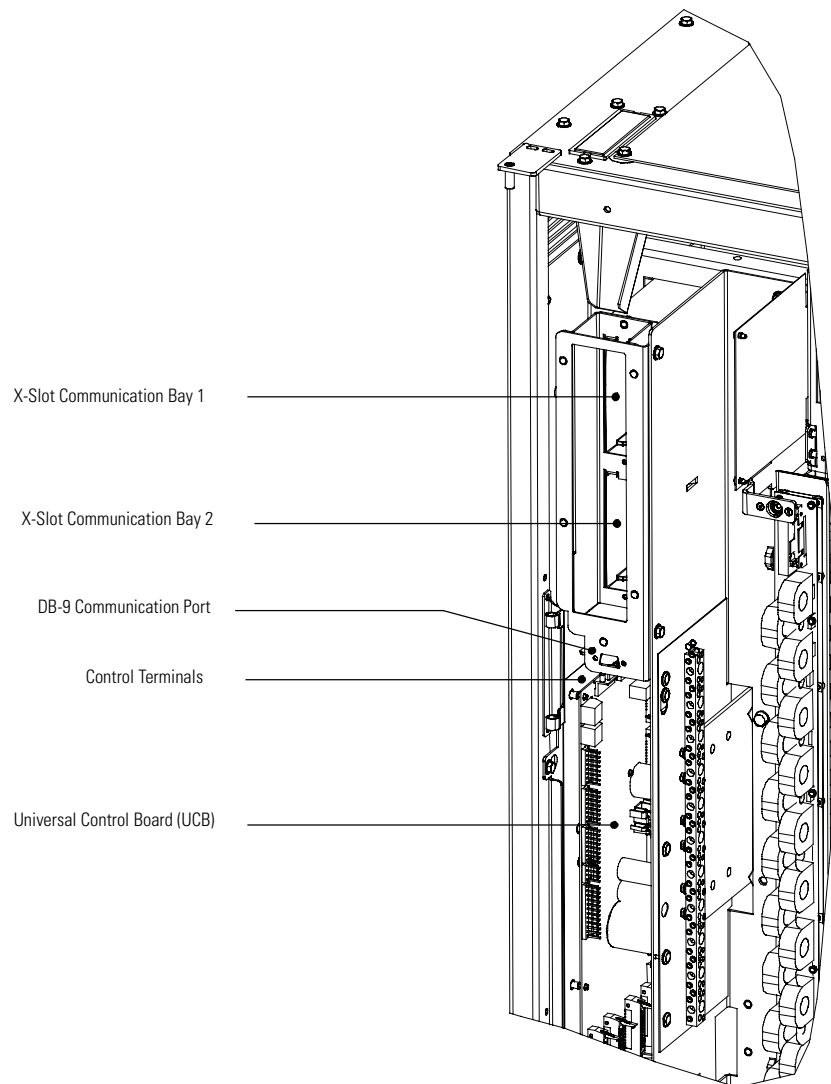


Figure 19. Communication Options and Control Terminals

Installing Communication Options

To install the communication options and control terminals:

1. Install the appropriate X-Slot card and/or necessary cable(s). See Figure 20.

Note: Eaton recommends populating the X-Slot Communication Bay 2 (top slot) first, then if needed, use X-Slot Communication Bay 1 (bottom slot).

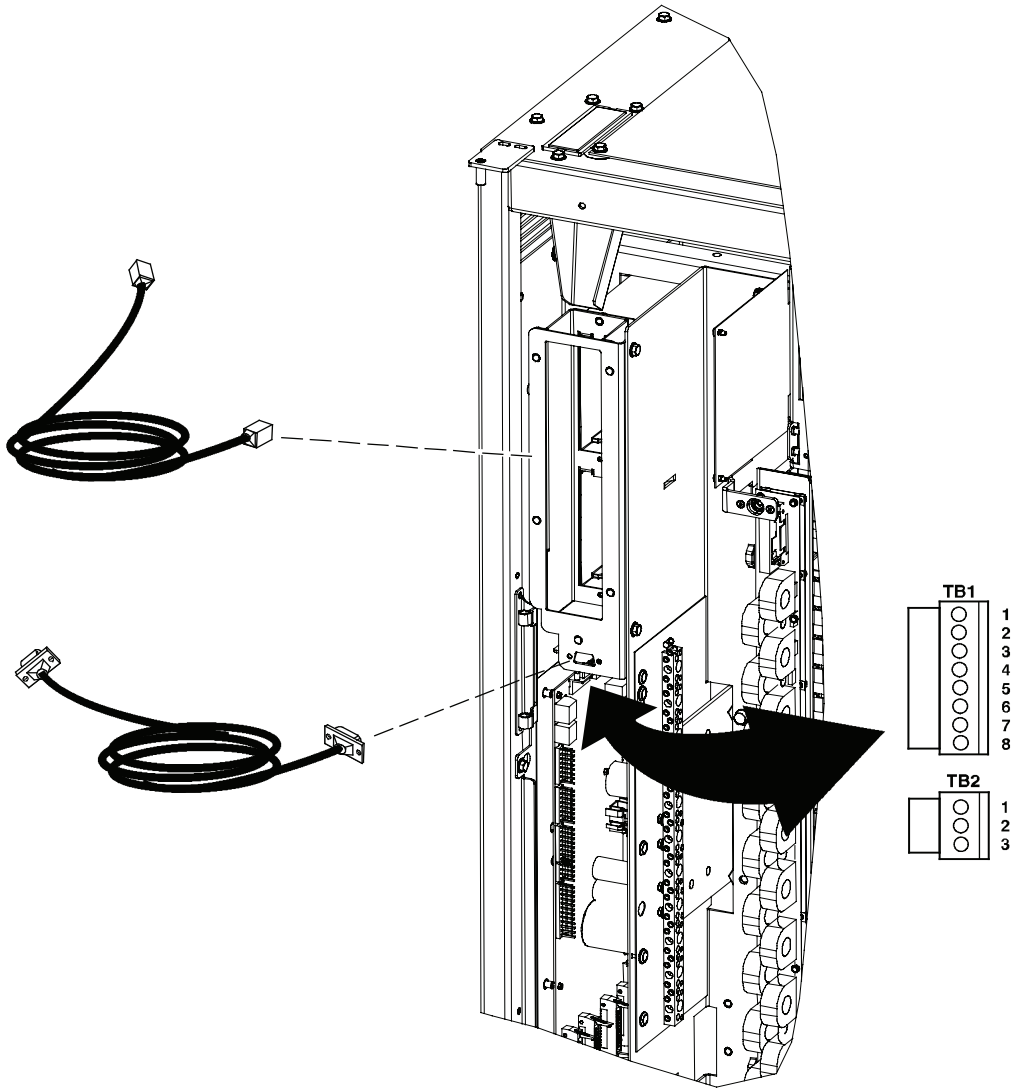


Figure 20. Installing Communication Connections

2. Connect the cables to the appropriate location.

See the following section, “Communication Options,” or “Control Terminals” on page 38 for detailed information.

Note: For ease of installation, unplug the terminal blocks from the UCB (see Figure 20), connect the cables, then plug the terminal blocks back onto the UCB.

3. Route and tie the cable(s) out of the way.

Communication Options

The RPP has serial communication capabilities through the DB-9 communication port or through an X-Slot card in one of the available bays. The RPP supports two serial communication devices according to the following table:

Independent		Multiplexed
X-Slot 2	X-Slot 1	DB-9 Communication Port
Any X-Slot card	Any X-Slot card	Not in use
Any X-Slot card	Not in use	Available

DB-9 Communication Port

To establish communication between the RPP and a computer, connect your computer to the RPP communication port using a communication cable.

The cable pins are identified in Figure 21 and the pin functions are described in Table 13. See Figure 19 on page 35 for the communication port location.

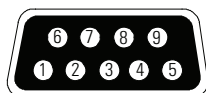


Figure 21. Communication Port

Table 13. Communication Port Pin Assignment

Pin Number	Signal Name	Function	Direction from the RPP
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	In
5	GND	Signal common (tied to chassis)	

Use the computer's HyperTerminal® (or equivalent) application to access Terminal mode. Table 14 lists available keystroke combinations for using Terminal mode through the RPP communication port.

Table 14. Terminal Mode

Key Combination*	Display	Comment
[ESC] [A]	Active Events	Displays a list of active events.
[ESC] [H]	History Log	Prints the History Log with a firmware version header, beginning with the oldest entry. Alarms that occur while the log is printing are included in chronological order. System events are continually logged through the serial port to the device connected to the port.
[ESC] [P]	Profile Log	Prints the Profile Log, beginning with the oldest entries.
[ESC] [V]	All screens (video mode)	Navigate the screens just as on the RPP's display, substituting the keyboard keys 1, 2, 3, 4, and 5 for the five pushbuttons on the RPP display. The indicators display as text to the right of the main screen.

* Hold down the [ESC] key and press the letter key.

X-Slot Cards

X-Slot cards allow the RPP to communicate in a variety of networking environments and with different types of devices. The RPP has two available communication bays for any X-Slot, including:

- Modbus® Card – provides direct integration of the RPP's parameters (meters and status) to a Building Management System (BMS) using the Modbus RTU protocol.

Note: Either the Power Xpert Gateway Card or the Power Xpert Gateway PXGX PDP Card can be used.

- Eaton Power Xpert® Gateway Card – Provides remote monitoring through a Web browser interface, e-mail, and a network management system using SNMP; connects to a twisted-pair Ethernet (10/100BaseT) network. Modbus Card TCP support provides direct integration of the RPP's parameters to a Building Management System (BMS). It has a built-in switching hub that allows one additional network device to be connected to the network without the requirement of an additional network drop.
- Eaton Power Xpert® Gateway PXGX PDP Card – provides Web-enabled, real-time monitoring of Eaton power distribution products (PDPs) through standard Web pages, Power Xpert Software, or third-party software. An integral part of the Eaton Power Xpert Architecture, which provides end-to-end PowerChain Management™ solutions, the PXGX PDP Card provides a central point to connect PDPs to the Ethernet network. Modbus TCP support provides direct integration of the PDU's parameters to a Building Management System (BMS). It has a built-in switching hub that allows one additional network device to be connected to the network without the requirement of an additional network drop.

LAN and telephone drops for use with X-Slot cards must be provided by the customer.

See Figure 19 on page 35 for the location of the two X-Slot communication bays.

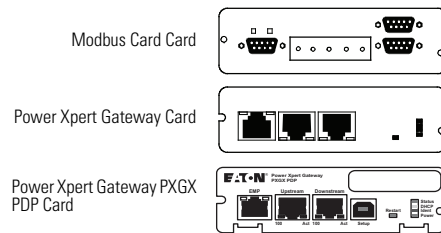


Figure 22. Optional X-Slot Cards

Control Terminals

Note: For ease of control wiring installation on the Large RPP, loosen the screws securing the control pan and slide the pan out (see Figure 23).

The cables should be connected to the control terminals with a mating connector. Input and output terminals have a functional isolation from terminal to terminal. They are connected to the RPP chassis through individual 1 MΩ resistors.

Note: If using a semiconductor switch type, pay attention to the proper polarity. A relay or other mechanical control is preferred.

Relay Output Contacts

The RPP incorporates a programmable relay output with potential free contacts for remote alarm indications.

An NC or NO contact can be used. If the state of the contact changes from the state you specify as normal, a signal is issued. This contact can be connected to equipment at the facility (such as a light or an alarm bell) to signal when an alarm is active on the RPP. This feature is useful if the RPP is located in a remote area where the RPP horn may not be heard immediately.

 **WARNING**

The relay output contacts must not be connected to any utility connected circuits. Reinforced insulation to the utility is required. The relay output contacts have a maximum rating of 240 Vac/8A.

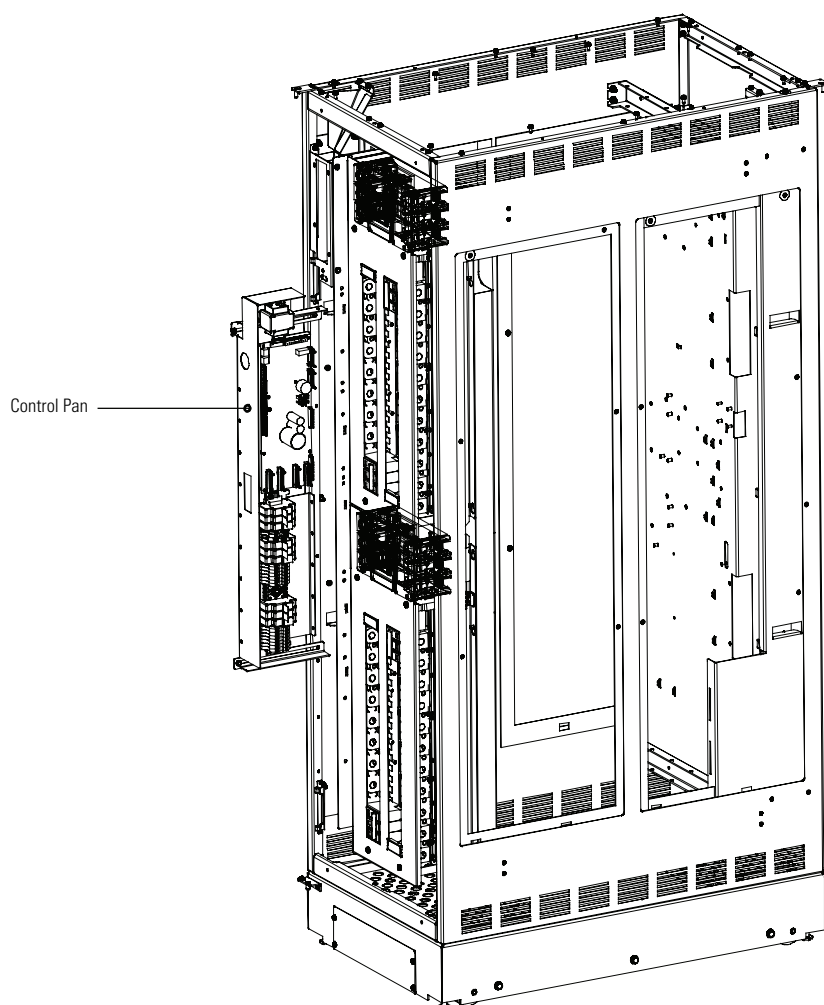
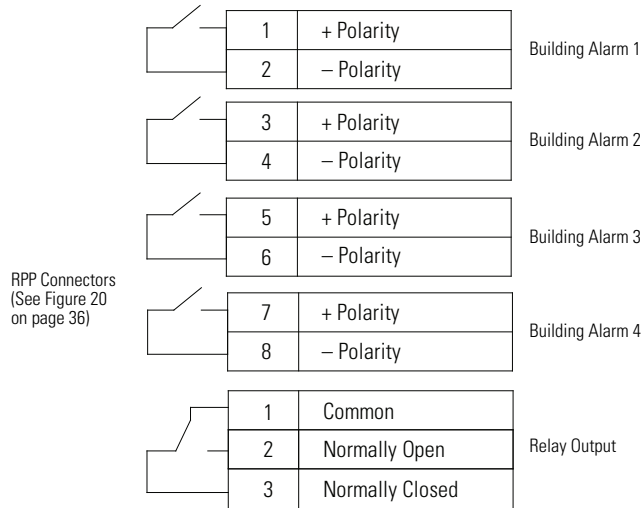


Figure 23. Large RPP Control Pan

Programmable Signal Inputs

The RPP incorporates four programmable signal inputs, each with a signal and a signal return. When the signal is shorted, the input is read as active. The pins must be shorted with a maximum resistance of 10 ohms to activate the specific input. Seventeen milliamps are required to drive the signal active.

Note: See Figure 24 for the polarity and verify these connections if polarity control is required.



Note:

Figure 24. External Control Terminal Connections

This feature lets you connect the RPP to your building alarms, such as smoke detectors or overtemperature alarms. For each building alarm, you can set:

- The building alarm name
- The contact type (NO or NC)
- Building alarm type
- Notice level

Chapter 6 Maintenance

This section explains how to

- Perform preventive maintenance for the Eaton Remote Power Panel (RPP)
- Store the RPP
- Recycle the RPP

Important Safety Instructions

The RPP interior is unsafe until AC source power is removed.

WARNING

- Servicing and maintenance should be performed by qualified service personnel only.
- RISK OF ELECTRIC SHOCK. This unit may receive power from more than one source. Disconnect all AC sources before servicing.
- LETHAL VOLTAGE PRESENT. This unit should not be operated with the cabinet doors open or safety panels removed. Do not make any assumptions about the electrical state of the RPP.

Preventive Maintenance

The RPP requires very little preventive maintenance. However, the system should be inspected periodically to verify that the unit is operating normally.

DAILY Maintenance

Perform the following steps daily:

1. Keep the area around the RPP clean and dust-free. If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner.
2. Verify that none of the ventilation accesses are blocked.
3. Verify that the operating environment is within the parameters specified in Table 20 on page 44.
4. Record the check results and any corrective actions in a suitable log.

PERIODIC Maintenance

Inspect the RPP periodically to determine if components, wiring, and connections exhibit evidence of overheating or other damage. Give particular attention to bolted connections. Re-torque the bolted connections to their appropriate values as needed.

Refer to the distribution panel manufacturer's circuit breaker application and maintenance literature for recommended maintenance practices and procedures.

ANNUAL Maintenance

Annual preventive maintenance, if required, should be performed only by authorized service personnel familiar with maintenance and servicing of the RPP. Contact your service representative for more information about service offerings.

Short Circuits

Short circuits are not considered normal phenomena in RPP system applications. Tripping of protective devices due to low impedance short circuits should be thoroughly investigated for damage to conductors, insulation, and the protective devices in accordance with the manufacturer's recommendations.

Cooper Bussmann Fuse Replacement

The disconnect fuses need to be replaced with same class and rating Cooper Bussmann fuses to maintain the 200 KAIC rating. Fuses are Cooper Bussmann CUBEFuse and are available in indicating (shows if the fuse is blown) or non-indicating types. Ratings are available from 1A to 60A. See Figure 25 for the spare fuse compartment location.

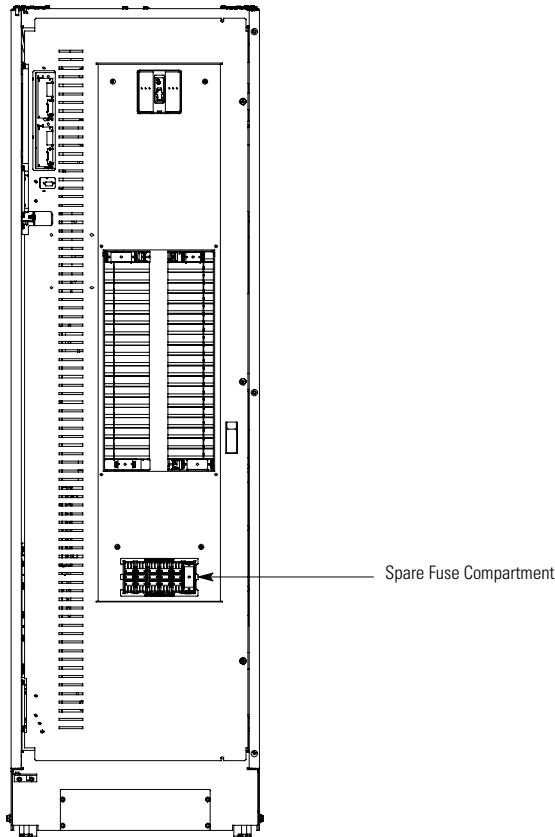


Figure 25. Cooper Bussmann Panel Spare Fuse Compartment

Storage

If you store the RPP for any period, store it with its protective packaging material in place. Protect the stored equipment at all times from excessive moisture, dirt, corrosive conditions, and other contaminants. See Table 20 on page 44 for environmental specifications.

Do not store the RPP outdoors or stack other equipment on top of the RPP, whether packaged or not.

Recycling the Used RPP

Contact your local recycling or hazardous waste center for information on proper disposal of the used RPP.



CAUTION

Do not discard the RPP in the trash. This product must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center.



CAUTION

Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

Chapter 7 Specifications

This section provides the following specifications for the Eaton Remote Power Panel (RPP):

- Model number
- Weights and dimensions
- Electrical input and output
- Meter
- Environmental and safety
- Surge Protective Device (SPD)

Table 15. Model Number

Model	Feeds
Eaton RPP	Up to four separate incoming feeds (450A, 900A)

Table 16. Weights and Dimensions

Dimensions (WxDxH)	Small RPP Footprint Only: 610 x 610 x 2032 mm (24" x 24" x 80") Including One Door: 610 x 648.5 x 2032 mm (24" x 25.5" x 80") Including Two Doors: 610 x 684.5 x 2032 mm (24" x 27" x 80")
	Large RPP Footprint Only: 610 x 992 x 2032 mm (24" x 39" x 80") Including One Door: 610 x 1031 x 2032 mm (24" x 40.6" x 80") Including Two Doors: 610 x 1067 x 2032 mm (24" x 42" x 80")
Maximum Weight	Small RPP: 399 kg (880 lb) Large RPP: 445kg (980 lb) Note: Weights are approximate. Weight varies depending on installed options.

Table 17. Electrical Input

Nominal Input Voltage	208/120 Vac or 400/230 Vac three-phase, 4 wire + G
Input Voltage Range	+10/-15%
Nominal Input Frequency	50/60 Hz
Input Frequency Range	45–65 Hz
Input Ratings	180A, 200A, 225A, 320A, 360A, 400A, 450A, 540A, 640A, 675A, 720A, 800A
Connections	Direct connection to panelboard circuit breakers or switch Single and Dual Main Lug Options Power terminals provide connection of up to a 200% rated neutral and a parity-sized insulated ground

Table 18. Electrical Output

Nominal Output Voltage	208/120 Vac or 400/230 Vac three-phase, 4 wire + G
Output Voltage Range	+10/-15%
Nominal Output Frequency	50/60 Hz
Output Frequency Range	45–65 Hz

Specifications

Table 19. EMS Meter

Calibration	Fully calibrated at the factory
Clock	Real Time Clock (RTC) with one-second resolution, automatic leap year adjustment, and one month backup time
Display	Backlit LCD panel with 8 lines by 40 characters (approximately 64 x 240 pixels), 4 LED indicators, and 5 pushbuttons

Table 20. Environmental and Safety

Operating Temperature	0°C to 40°C (32°F to 104°F) without derating. The recommended operating temperature is 25°C (77°F)
Storage Temperature	-25°C to 60°C (-13°F to 140°F)
Relative Humidity	10% to 95% maximum noncondensing
Operating Altitude	Maximum 1500m (5000 ft) at 40°C without derating
Heat Dissipation	3412 BTU/hr maximum
Audible Noise	Less than 45 dBA at 1.5m (5 ft)
EMI Suppression	Meets FCC Regulation 47, Part 15, for class A devices
Electrostatic Discharge (ESD) Immunity	Meets IEC 801-2 specifications. Withstands up to 25 kV pulse without damage and with no disturbance or adverse effect to the critical load.
Agency Markings	US Domestic/Canadian: Marking – cULus Standard – UL60950-1:2007, CAN/CSA-C22.2 No. 60950-1-07

Table 21. SPD

Technology	Thermally Protected Metal Oxide Varistors (TPMOVs)
Peak Surge Current	100 kA/phase (Non-EMS monitored) 100 kA/phase (EMS monitored) 200 kA/phase (EMS monitored)
Nominal Discharge Current	20kA
Indicators (for Non-EMS monitored model only)	Three high intensity LED indicator for each phase protected
Noise Attenuation (for EMS monitored models only)	EMI/RFI filtering, up to 50 dB noise attenuation from 10 kHz to 100 MHz
Safety Conformance	UL 1449 3rd Edition
Relay Contact (for EMS monitored models only)	Form C relay contact monitored by Eaton EMS

Chapter 8 Troubleshooting

Typical Alarms and Conditions

The following table describes typical alarms and conditions for the Remote Power Panel (RPP). For further help, please contact the Help Desk.

To view the active alarms or alarm history, select EVENTS on the display, then ACTIVE EVENTS or HISTORY.

To silence the horn, press any button.

Alarm or Condition	Possible Cause	Action
Output current registers as zero on external communications device.	With no transformer, input current equals output current.	View the current meters on the Input RMS screen. The output current is the same as the input current.

Service and Support

If you have any questions or problems with the RPP, call your Local Distributor or the Help Desk at one of the following telephone numbers and ask for an RPP technical representative.

United States: **1-800-843-9433**

Canada: **1-800-461-9166 ext 260**

All other countries: **Call your local service representative**

Please have the following information ready when you call for service:

- Model number
- Serial number
- Firmware version number
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) Number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped, freight prepaid for all warrantied units.

Note: For critical applications, immediate replacement may be available. Call the Help Desk for the dealer or distributor nearest you.

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Chapter 9 Warranty

Limited Factory Warranty

Three Phase Eaton Power Distribution Unit (PDU), Remote Power Panel (RPP), and Static Switch (STS) Products

WARRANTOR: The warrantor for the limited warranties set forth herein is Eaton Corporation, a Delaware Corporation (“Eaton”).

LIMITED WARRANTY: This limited warranty (this “Warranty”) applies only to the original end-user (the “End-User”) of the Eaton Three-Phase PDU, RPP, and STS Products (the “Product”) and cannot be transferred. This Warranty applies even in the event that the Product is initially sold by Eaton for resale to an End-User. **This warranty is not valid unless a separately purchased Startup service is purchased.**

LIMITED WARRANTY PERIOD: The period covered by this Warranty for Product installed [and currently located] in the fifty (50) United States and the District of Columbia is twelve (12) months from the date of Product startup or eighteen (18) months from the date of Product shipment, whichever occurs first, for parts coverage and 90 days from the date of Product startup for labor coverage. The period covered by this Warranty for Product installed [and currently located] outside of the fifty (50) United States and the District of Columbia is twelve (12) months from the date of Product startup or eighteen (18) months from the date of Product shipment, whichever occurs first, for parts coverage.

WHAT THIS LIMITED WARRANTY COVERS: The warrantor warrants that the Eaton three-phase PDU, RPP, and STS electronics and Eaton-provided accessories (individually and collectively, the “Warranted Items”) are free from defects in material and workmanship. If, in the opinion of Eaton, a Warranted Item is defective and the defect is within the terms of this Warranty, Eaton's sole obligation will be to repair or replace such defective item (including by providing service, parts, and labor, as applicable), at the option of Eaton. The Warranted Item will be repaired or replaced onsite at the End-User's location or such other location as determined by Eaton. Any parts that are replaced may be new or reconditioned. All parts replaced by Eaton shall become the property of Eaton.

WHAT THIS LIMITED WARRANTY DOES NOT COVER: This Warranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, fire, flood, lightning, vandalism, acts of God, Customer's neglect, abuse, misuse, misapplication, incorrect installation; (d) repair or alteration not authorized in writing by Eaton personnel or performed by an authorized Eaton Customer Service Engineer or Agent; or (e) improper testing, operation, maintenance, adjustment, or any modification of any kind not authorized in writing by Eaton personnel or performed by an authorized Eaton Customer Service Engineer or Agent.

This Warranty is not valid: (a) unless an authorized Eaton Customer Service Engineer (in the USA) or Agent (outside of the USA) performs startup and commissioning of the Product; (b) if the Product is moved to a new location by someone other than an authorized Eaton Customer Service Engineer (in the USA) or Agent (outside of the USA); or (c) if the Product's serial numbers have been removed or are illegible. Any Warranted Items repaired or replaced pursuant to this Warranty will be warranted for the remaining portion of the original Warranty subject to all the terms thereof. Labor warranty is not provided for Product located outside of the fifty (50) United States or the District of Columbia. **Any equipment, parts, or materials included in the Product and not manufactured by Eaton** are warranted solely by the manufacturer of such equipment, parts, or materials and are not included as part of this Warranty.

THIS WARRANTY IS THE END-USER'S SOLE REMEDY AND IS EXPRESSLY IN LIEU OF, AND THERE ARE NO OTHER EXPRESSED OR IMPLIED GUARANTEES OR WARRANTIES (INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED).

LIMITATION OF LIABILITY: In no event shall Eaton be liable for any indirect, incidental, special, or consequential damages of any kind or type whatsoever, or based on any claim or cause of action, however denominated. Eaton shall not be responsible for failure to provide service or parts due to causes beyond Eaton's reasonable control. In no case will Eaton's liability under this Warranty exceed the replacement value of the Warranted Items.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Warranty, the End-User must use the Product in a normal way, follow the Product's user's guide, and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Eaton's obligations under this Warranty are expressly conditioned upon receipt by Eaton of all payments due to it (including interest charges, if any). During such time as Eaton has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Eaton shall have no obligation under this Warranty. Also during such time, the period of this Warranty shall continue to run and the expiration of this Warranty shall not be extended upon payment of any overdue or unpaid amounts.

COSTS NOT RELATED TO WARRANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Warranty, including without limitation site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses, or labor of Eaton representatives outside the terms of this Warranty will be borne by the End-User.

OBTAINING WARRANTY SERVICE: In the USA, call the Eaton Customer Reliability Center 7x24 at 800-843-9433. Outside of the USA, call your local Eaton sales or service representative, or call the Eaton Customer Reliability Center in the USA at 919-870-3028. For comments or questions about this Limited Factory Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.



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