AVAYA communication

Site Preparation, Installation and Operator's Manual

for

Extended Battery Charger Unit for use with Avaya Uninterruptible Power Systems

Select Code 167-405-315
Issue 2

Requesting a Declaration of Conformity

Units that are labeled with a CE mark comply with the following harmonized standards and EU directives:

- Harmonized Standards: EN 50091-1-1 and EN 50091-2
- 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

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

Powerware Corporation
Koskelontie 13
FIN-02920 Espoo
Finland
Phone: +358-9-452 661
Fax: +358-9-452 665 68

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

This Class A Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

Cet appareil numérique de la classe A respecte toutes les exigences du Reglement sur le matériel brouilleur du Canada.

EN50091-2

Some configurations are classified under EN50091-2 as “Class-A UPS for Unrestricted Sales Distribution.” For these configurations, the following applies:

WARNING This is a Class A-UPS Product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take additional measures.

Safety Warnings

This manual contains important instructions for your Avaya UPS Extended Battery Charger Unit (EBCU) that should be followed during installation and maintenance of the UPS and batteries.

The EBCU uses two AC power cords rated at 120 Vac, 6A each. Both must be connected for the batteries to charge.

DO NOT use any other sizes or types of batteries with the EBCU.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

DANGER

- Risk of electrical shock. Installation of battery cabinets must be done by trained service personnel.
- To reduce the risk of fire, connect both AC power cords only to a single circuit provided with 15A maximum branch circuit overload protection in accordance with the National Electrical Code, ANSI/NFPA 70.

CAUTION

- Never dispose of batteries in a fire. Batteries may explode when exposed to flames. In the event of a fire involving the UPS and its batteries, use only carbon dioxide fire extinguishers or those approved for use in electrical fire fighting.
- Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.
- Never open or mutilate batteries. Released electrolyte is harmful to the skin and eyes, and may be extremely toxic.
- Batteries can present a risk of electrical shock or burn from high short-circuit current, fire, or explosion from vented gases. Observe proper precautions.
- Proper disposal of batteries is required. Refer to your local codes for disposal requirements.

CAUTION

- Batteries can present a risk of electrical shock or burn from high short circuit current. The following precautions should be observed: 1) Remove watches, rings, or other metal objects; 2) Use tools with insulated handles; 3) Do not lay tools or metal parts on top of batteries; 4) Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

Table of Contents

CHAPTER 1

INTRODUCTION

Thank you for your purchase of the Avaya Extended Battery Charger Unit (EBCU). The Avaya EBCU is an accessory for your Avaya UPS that extends the battery-backup run times for the UPS. The EBCU provides 240 Vdc and includes a charging system.

Please follow the safety precautions in your Avaya UPS operator's manual before installing your EBCU. The EBCU can only be used on the following Avaya UPS models:

UPS Model	PEC	Avaya Comcode
3 kVA	2403-203	406313007
4.5 kVA	2403-245	406929620
5 kVA	2403-205	406313015
6 kVA	2403-206	406974071
8 kVA	2403-208	406929638
10 kVA V1	2403-210	406341016
10 kVA V2	2403-220	406974089
12 kVA	2403-222	406974097
14 kVA V1	2403-314	406687616
14 kVA V2	2403-314	407236389
18 kVA V1	2403-318	406672352
18 kVA V2	2403-318	407269638

UPS Model and Battery Configurations

There are two important considerations you need to evaluate when selecting the UPS model and battery configuration for your equipment:

1. **Load requirements of the equipment you want to protect.** Select the UPS model that meets the power consumption requirements of the equipment you want to protect. “Load Requirements” explains how to determine the load requirements (refer to your Avaya UPS operator’s manual).
2. **Battery protection time.** During a power failure, the UPS operates on battery, providing time to complete your computing activities prior to UPS shutdown. The duration of this time period is directly related to the UPS battery configuration and the amount of load on the UPS. By adding EBCUs, you can customize your UPS to provide enough battery protection time for normal processing activities.

EBCU System Recharge Time

A fully discharged EBCU will recover to 80% capacity in 16 hours.

EBCU System Discharge Time (8 kVA, 10 kVA, 12 kVA UPS)

The following table displays the approximate discharge times, shown as a function of time versus load in VA.

Load (VA)*	Number of EBCUs Required for Backup Time							
	1 Hour	2 Hours	3 Hours	4 Hours	5 Hours	6 Hours	7 Hours	8 Hours
2000								
3000							2	2
4000				2	2	2	3	3
5000			2	2	3	3	3	4
6000			2	3	3	3	4	4
7000		2	2	3	3	4	4	5
8000		2	3	3	4	4	5	5
9000		2	3	3	4	5	5	6
10000		2	3	4	5	5	6	7
11000		2	3	4	5	6	7	7
12000		3	4	5	5	6	7	8

*Based on load power factor of 0.67.

NOTE Do not connect more than 8 EBCUs to the UPS.

EBCU System Discharge Time (14 kVA and 18 kVA UPS)

The following table displays the approximate discharge times, shown as a function of time versus load in VA.

Load (VA)*	Number of EBCUs Required for Backup Time							
	1 Hour	2 Hours	3 Hours	4 Hours	5 Hours	6 Hours	7 Hours	8 Hours
3000				2	2	2	2	2
4000				2	2	2	3	3
5000				2	3	3	3	4
6000			2	2	3	4	4	5
7000			2	3	3	4	4	5
8000			3	3	4	4	5	5
9000		2	3	3	4	5	5	6
10000		2	3	4	5	5	6	7
11000		2	3	4	5	6	7	7
12000		3	4	4	5	6	7	8
13000	2	3	4	5	6	7	8	9
14000	2	3	4	5	6	7	8	9
15000	2	3	4	5	7	8	9	10
16000	2	3	5	6	7	8	9	10
17000	2	4	5	6	7	9	10	11
18000	2	4	5	6	8	9	10	12

*Based on load power factor of 0.67.

NOTE Do not connect more than 12 EBCUs to the UPS.

CHAPTER 2

INSTALLATION

The following sections describe the installation and physical setup of the Extended Battery Charger Unit. See the "Remote Battery Installation" section of your Avaya UPS operator's manual for detailed instructions on configuring your UPS for remote battery use.

CAUTION

The internal UPS charger must be disabled before the installation of the EBCU (see "Disabling the Charger" below).

NOTE The EBCU is shipped without side covers.

- For new installations, the UPS right side cover and screws must be retained for use on the last EBCU.
- For battery cabinet replacement installations, the side cover and screws from the last battery cabinet must be retained for use on the last EBCU.

Unpacking and Inspection

Carefully unpack the UPS and EBCUs, making sure to retain the packaging materials for future shipment of the units. Examine each unit carefully for any signs of damage and immediately notify your Avaya service representative if damage is present.

Disabling the Charger

Read all of the caution and warning statements in "Safety Warnings" of your Avaya UPS operator's manual before disabling the charger or installing the EBCU.

See one of the following sections for disabling the UPS charger according to your UPS model:

- For 3 kVA – 6 kVA UPS models, use the following procedure.
- For 8 kVA – 18 kVA UPS models, see page 11.

NOTE Prepare your equipment for shutdown. The following procedures remove power to the UPS load.

3 kVA – 6 kVA UPS Models

Use the following procedure to disable the charger on 3 kVA – 6 kVA UPS models:

1. Push and hold the UPS Off button on the UPS front panel. The alarm sounds for three seconds and the Normal indicator goes off.
2. Switch the output breaker and battery breaker on the UPS rear panel to the OFF (O) position (see Figure 1). If your UPS has a battery fuse instead of a breaker, remove the fuse. Retain the fuse. Wait five minutes to allow internal discharging.

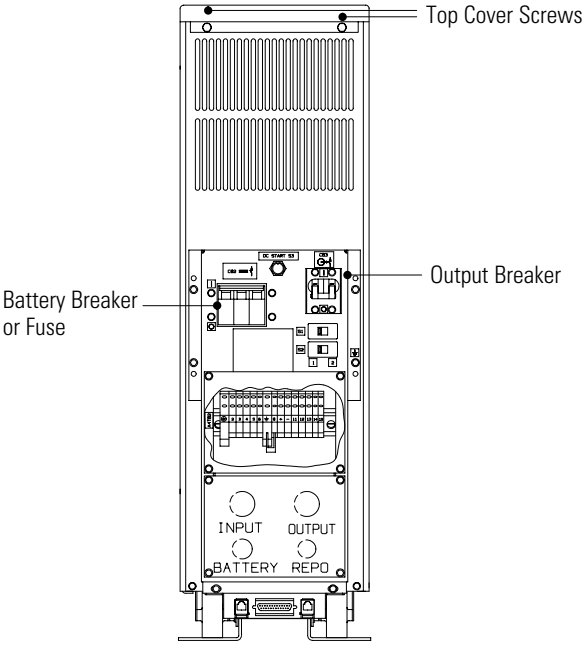

Figure 1. UPS Rear Panel (6 kVA and Below)

3. Unplug the UPS from the power source.

4. Remove the UPS top cover by removing the two screws on the top rear of the unit. Pull the top cover toward the rear of the unit to release the cover latch and lift the cover off (see Figure 2).

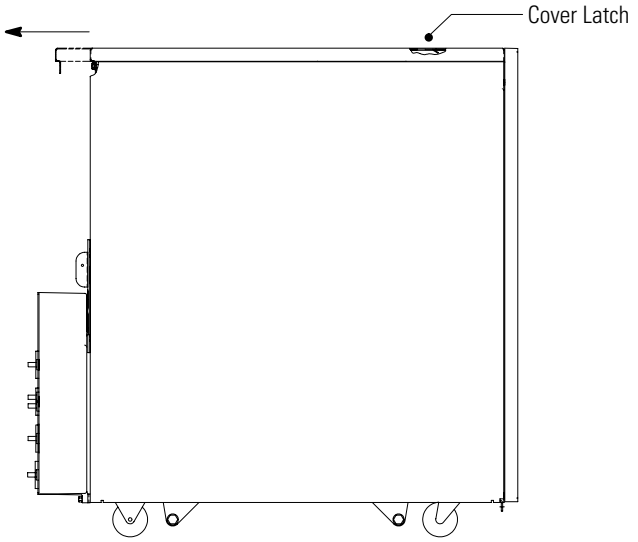

Figure 2. Removing the Top Cover

5. Remove the UPS left and right covers by removing the mounting screws. Pull the covers up toward the top and then down to remove.

NOTE If this is a new installation, the UPS right side cover and screws must be retained for use on the right side of the last EBCU.

6. Locate the cover plate for the Rectifier Module on the left side of the UPS (see Figure 3).

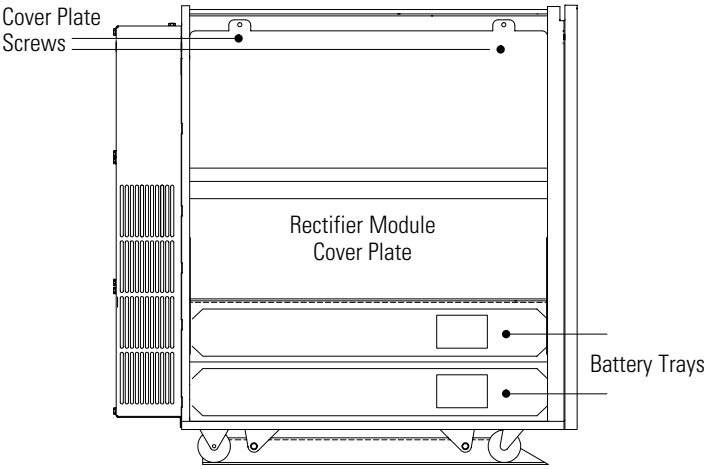

Figure 3. 3 kVA – 6 kVA UPS with Left Side Panel Removed

7. Remove the two screws holding the Rectifier Module panel in place. Retain the screws.
8. Lower the panel to expose several printed circuit boards mounted on the inside of the panel.

   The UPS has two metal tabs on the lower left and right corners that hold the panel in place while work is performed. Slide the panel into these tabs without stressing the internal wiring (see Figure 4).

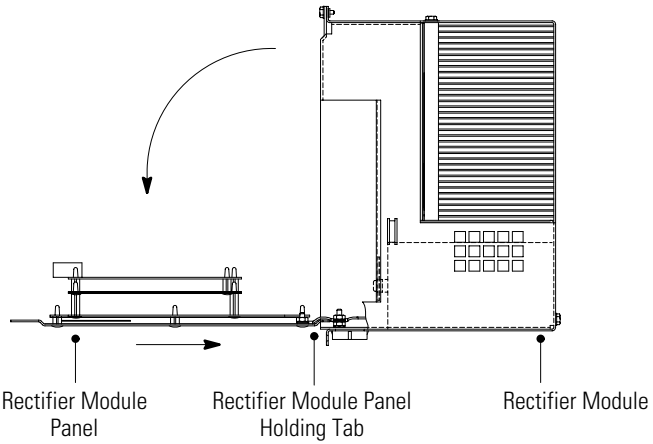

Figure 4. Right Side View with Rectifier Module Panel Lowered

9. Locate the rectifier control board (A1A1) in the center of the Rectifier Module panel (see Figure 5). Remove the quick-connect from the rectifier control board labeled “6 kVA” or “E3.”

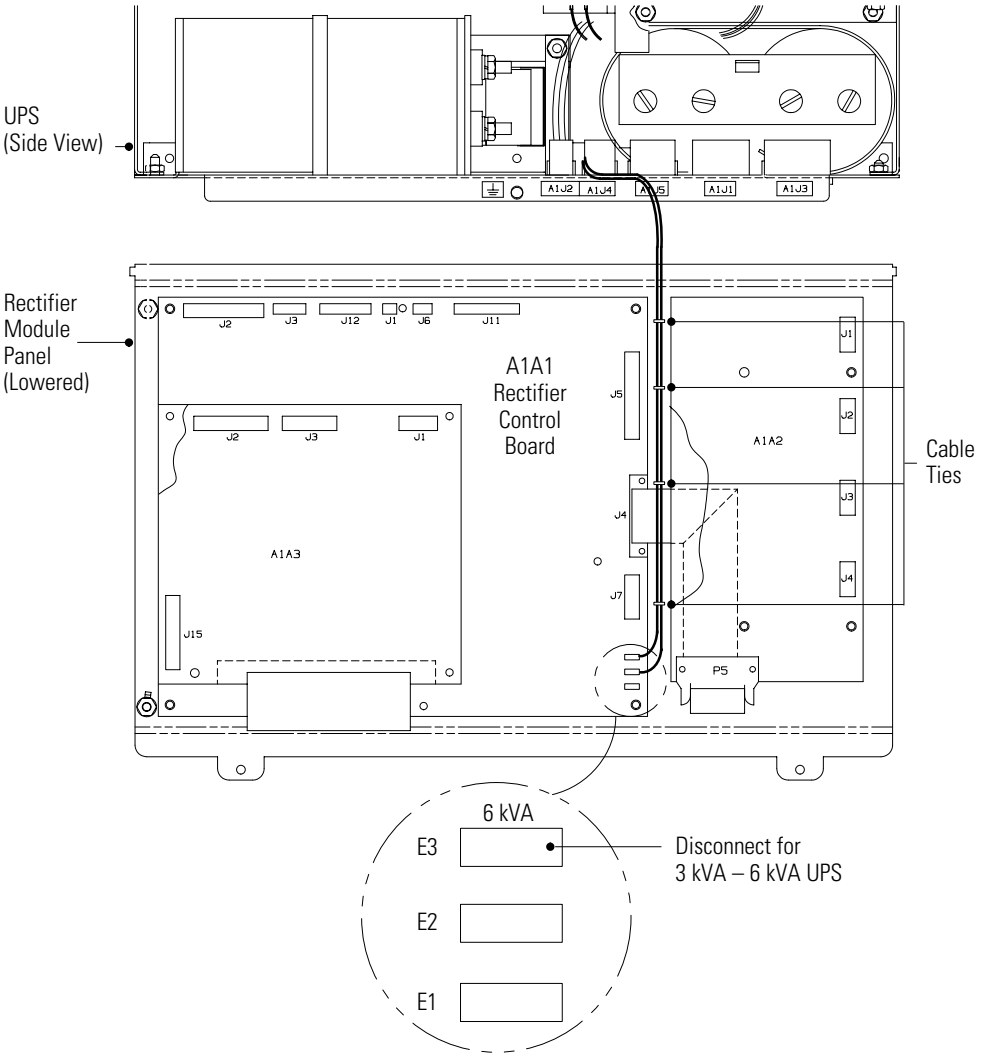

Figure 5. Rectifier Module Panel for the 3 kVA – 6 kVA UPS

10. Using caution not to damage the wires, cut the four cable ties securing the wires together on the Rectifier Module panel.

11. Secure the disconnected wire with the supplied 7″cable tie at A1J2 (see Figure 6). Verify the open end of the quick-connect is facing toward the interior of the Rectifier Module.

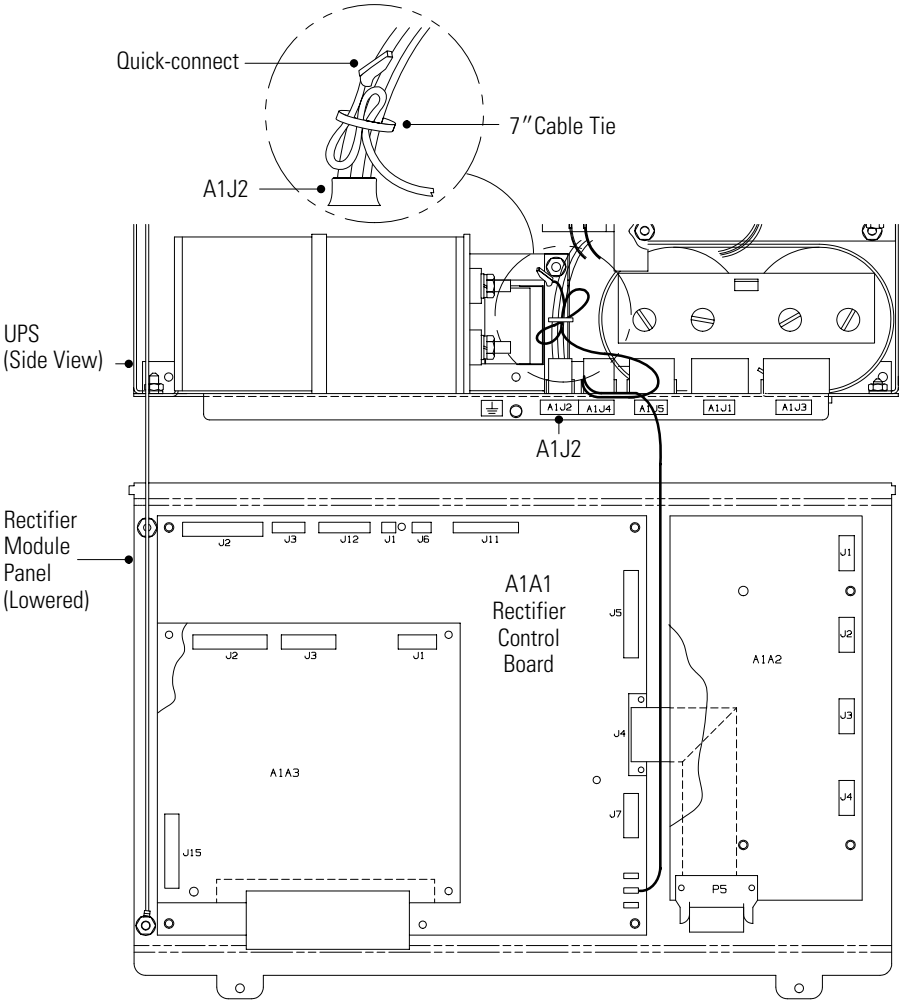

Figure 6. Charger Disabled on the 3 kVA – 6 kVA UPS

12. Using caution not to damage or pinch any wires, raise and close the Rectifier Module panel. Secure the panel with the two screws removed in Step 7.

13. Replace the top and left side UPS covers.

14. **Disconnect the two internal battery trays (see Figure 3 on page 8).** The battery connectors are located just inside the square opening on each tray.

    Place the loose harness into the open area immediately below the rectifier and push the battery connectors into the square open area.

15. Continue to "Installing the EBCU" on page 15.

8 kVA – 18 kVA UPS Models

Use the following procedure to disable the charger on 8 kVA – 18 kVA UPS models:

1. Push and hold the UPS Off button on the UPS front panel.
2. Raise the top hinged cover and remove the left side panel from the UPS.
3. Turn off (O) the input, output, and battery breakers. Wait five minutes to allow internal discharging.

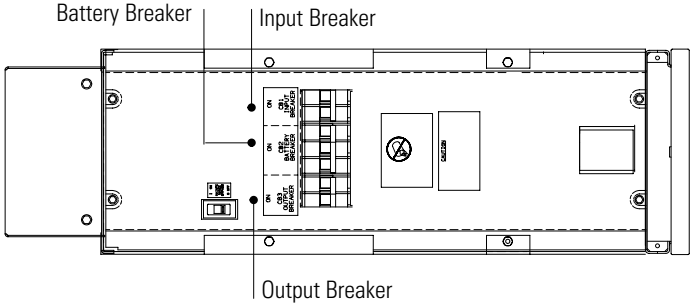

Figure 7. UPS with Top Cover Removed (8 kVA – 18 kVA UPS Models)

4. Disconnect the UPS from the power source by switching the distribution panel input circuit breaker to the OFF position. Place a red tag on the distribution panel circuit breaker connected to the UPS to signify work in progress.
5. Locate the cover plate for the Rectifier Module on the left side of the UPS (see Figure 8).

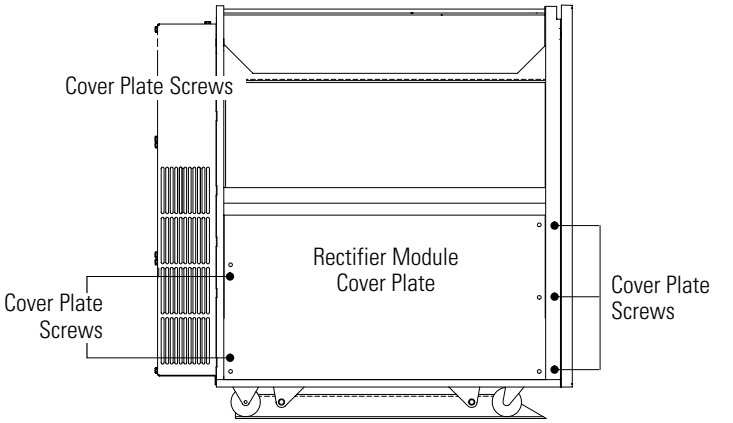

Figure 8. 8 kVA - 18 kVA UPS with Left Side Panel Removed

6. Remove the five screws holding the Rectifier Module panel in place. Retain the screws.
7. Lower the panel to expose several printed circuit boards mounted on the inside of the panel.

   The UPS has two metal tabs on the lower left and right corners that hold the panel in place while work is performed. Slide the panel into these tabs without stressing the internal wiring (see Figure 9).

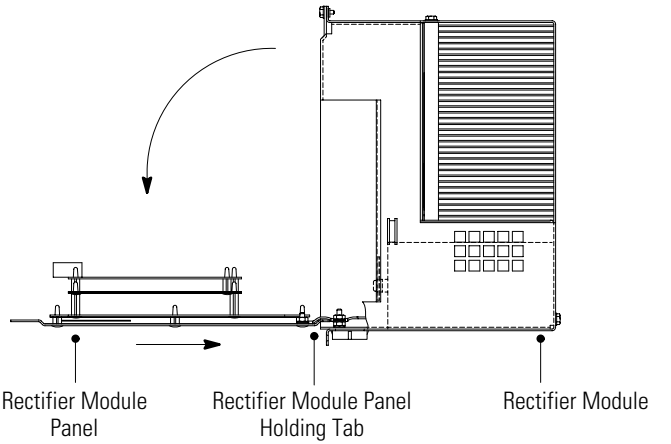

Figure 9. Right Side View with Rectifier Module Panel Lowered

8. Locate the rectifier control board (A1A1) in the back right corner of the Rectifier Module panel (see Figure 10). Remove the quick-connect from the rectifier control board labeled "12/18 kVA" or "E1."

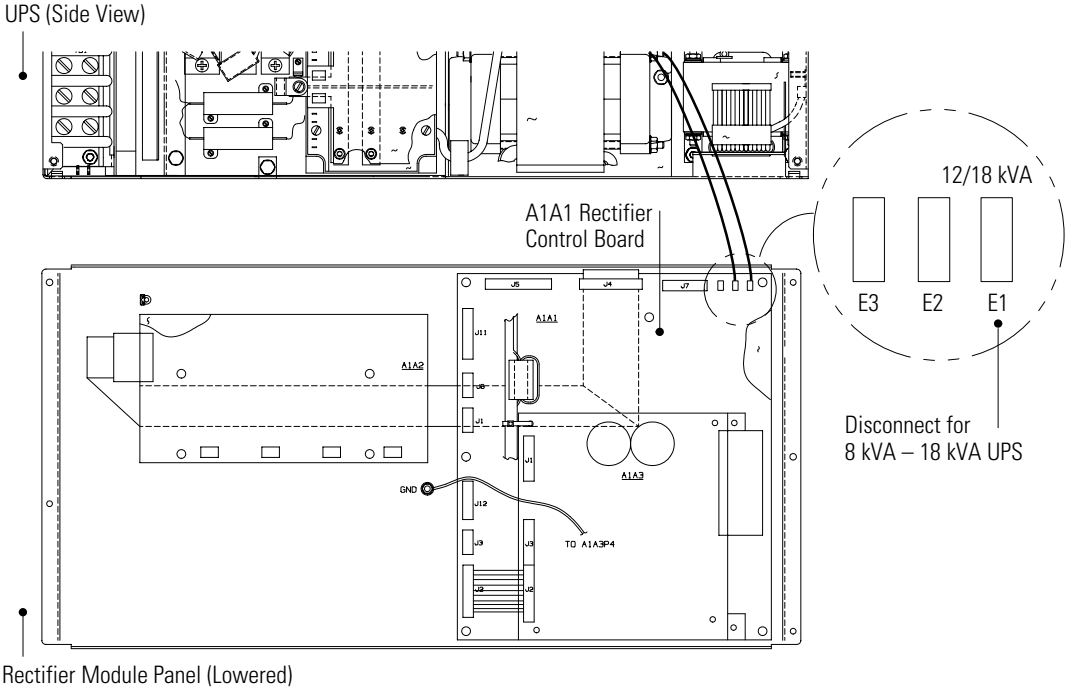

Figure 10. Rectifier Module Panel for the 8 kVA – 18 kVA UPS

9. Place 3″of the provided heat shrink tubing over the quick-connect. Fold the remaining tubing over the covered quick-connect and secure it with the provided 4″cable tie (see Figure 11).

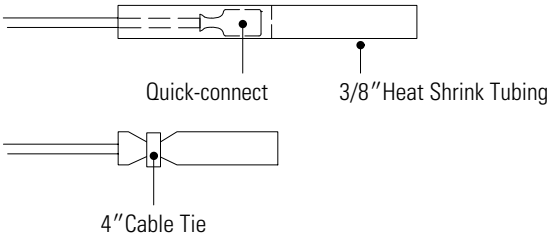

Figure 11. Covering the Quick-connect on the 8 kVA – 18 kVA UPS

10. Secure the disconnected wire to the neutral wire on the E2 terminal with the provided 4″cable tie (see Figure 12).

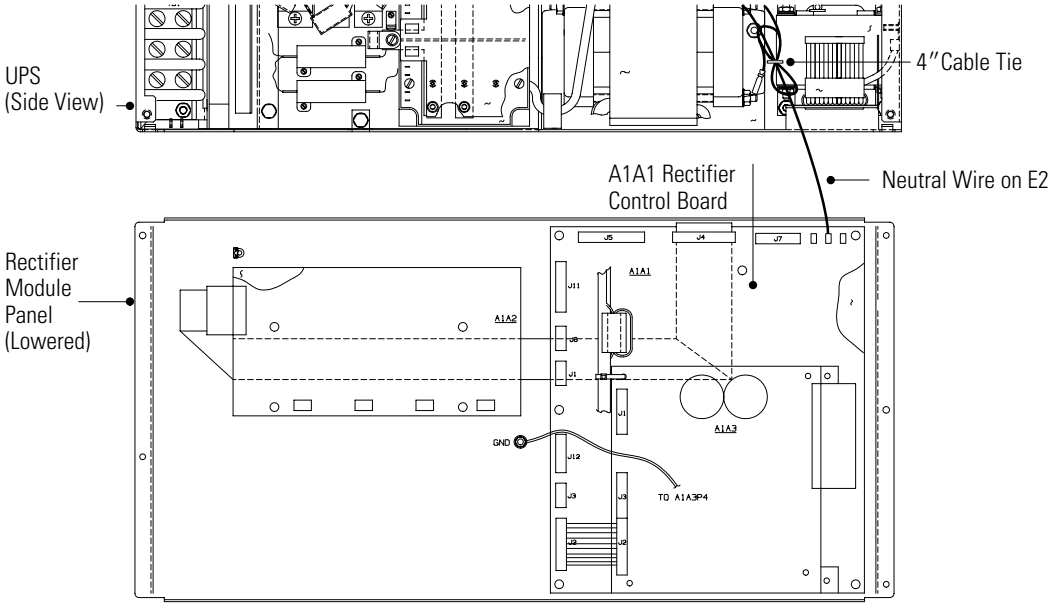

Figure 12. Charger Disabled for the 8 kVA – 18 kVA UPS

11. Using caution not to damage or pinch any wires, raise and close the Rectifier Module panel. Secure the panel with the five screws removed in Step 6.

12. Replace the UPS left side cover.
13. Continue to the following section, "Installing the EBCU."

Installing the EBCU

CAUTION

- This unit is intended to be used without any other types of batteries. If you have other battery types connected to the UPS, remove them before connecting the EBCU.
- The internal UPS charger must be disabled before the installation of the EBCU (see "Disabling the Charger" on page 5).

The following instructions assume you have already removed the EBCUs from the pallets according to the unloading instructions on the outside of the shipping box.

Use the following procedure to install the EBCU:

1. Place the EBCU near the operating site. DO NOT join the cabinets at this time. The UPS should be well ventilated and away from direct sunlight or other heat source.

NOTE It is recommended to allow a minimum of 4.5″of space from the rear of the charger for proper ventilation.

2. If you are using only one EBCU and want increased stability or a seismic installation, remove the mounting plates from the pallets (see Figure 13). Otherwise, skip to Step 5 on page 18.

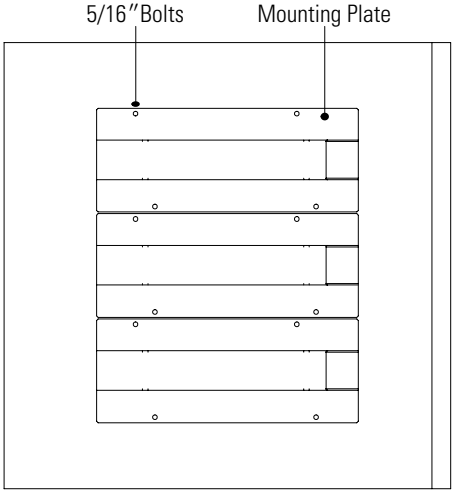

Figure 13. Seismic Installation Mounting Plates

3. A seismic installation of the EBCU requires that the mounting plates be bolted to the floor. See Figure 14 for a detailed drill and mounting pattern.

NOTE For Zone 4, it is recommended to use 5/16″self-drill bolts and hardware with 1 5/16″minimum embedment for 3000PSI-strength concrete. Refer to your local building codes for seismic mounting requirements.

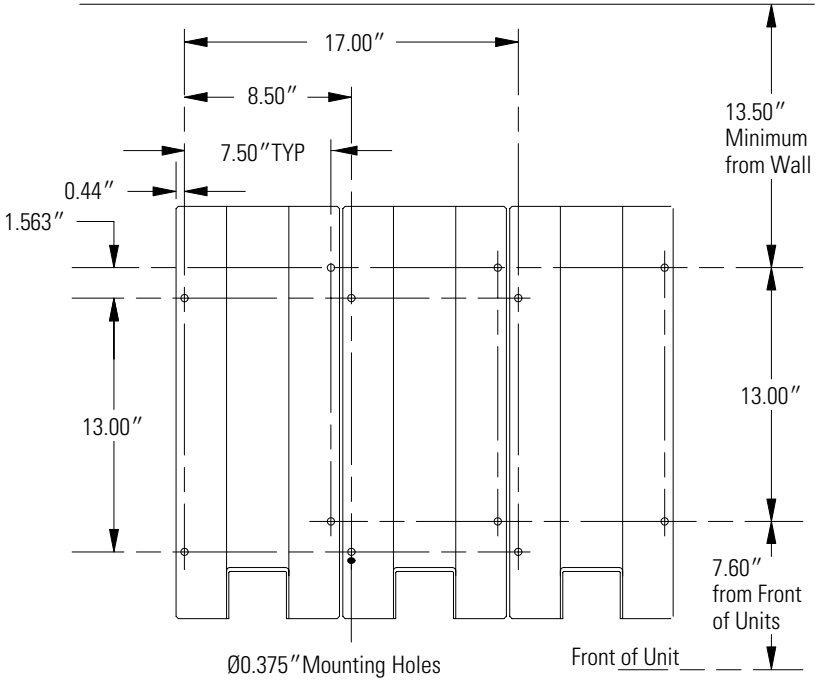

Figure 14. Seismic Installation Mounting Pattern

4. Using customer-supplied bolts, attach three mounting plates to the floor for each EBCU to be installed.

NOTE The floor mounting bolts are customer-supplied and should fit the 0.375″ diameter mounting holes on the mounting plates.

5. Verify the UPS power processing unit (PPU) is turned off.
6. Verify the circuit breaker on all EBCUs is in the OFF (O) position (see Figure 15).

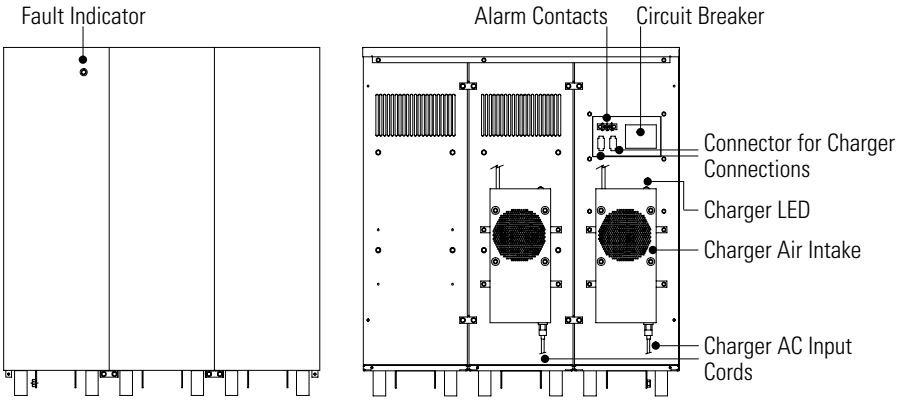

Figure 15. The EBCU (Front and Rear Views)

7. Remove the top cover of the EBCU by removing the three screws from the back of the unit.
8. The connector used to connect the EBCU to the UPS is attached with a wire tie to the inside top of the EBCU. It is located above the circuit breaker at the edge of the large top opening. Release the red, 2-pole connector by cutting the wire tie.
9. Connect the red, two-pole connector to the UPS. All battery connectors are polarized to prevent incorrect connection.
10. **For seismic installations only.** Using the 5/16″ × 21 3/16″ bolts removed when unloading each cabinet from its pallet, secure the EBCU to the mounting plates.
11. With the cabinets now in their final position, join the cabinets together using the hardware provided in the kit tied to the rear of each unit. See Figure 16 and Figure 17 for joining details.

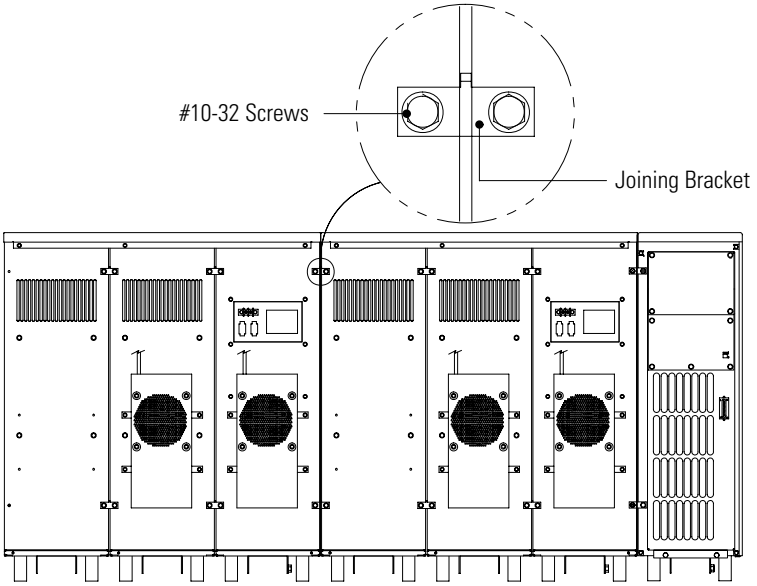

Figure 16. EBCU Joining Details (Rear View)

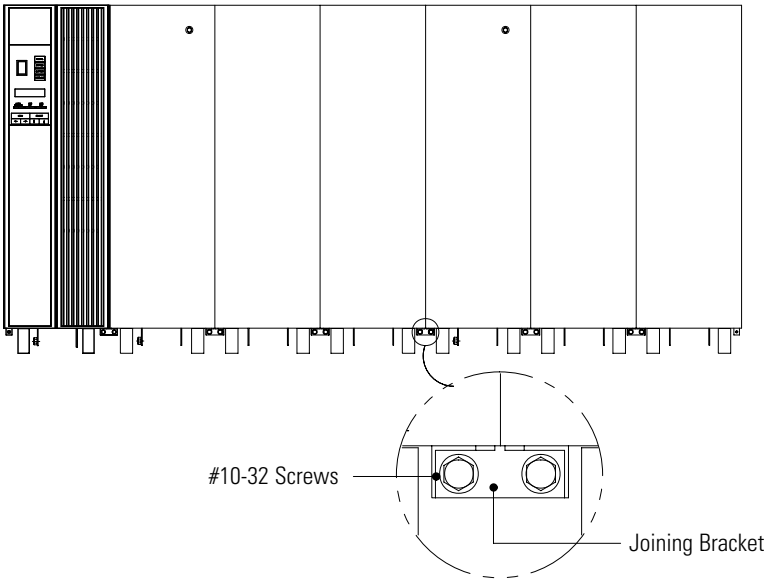

Figure 17. EBCU Joining Details (Front View)

12. **Each EBCU uses two chargers. Both chargers must be used.** For each charger, plug the IEC-320 power cord into the bottom of the charger, then plug the power cord into a wall outlet (each charger requires 6A for 120 Vac or 3A for 240 Vac for AC input).

    Once powered, the charger LED illuminates indicating that the charger is properly operating.

13. A second red, 2-pole connector is supplied to allow multiple EBCs to be connected. This connector is attached with a wire tie to the inside top of the EBCU. It is located at the end opposite the first connector (released in Step 8). If additional EBCUs are to be used, release the second red, 2-pole connector on the second EBCU by cutting the wire tie. Plug the connector of the second EBCU into the battery connector of the first EBCU. Follow this procedure for each additional EBCU.

14. Replace the EBCU top cover.

15. Remount the right side cover that was removed from the UPS cabinet or battery cabinet to the right side of the last EBCU. Use the original hardware.

16. Switch the circuit breaker to the ON (|) position on each EBCU connected to the UPS.

17. **For 3 kVA – 6 kVA UPS models only.** Switch the output breaker and battery breaker to the ON (|) position on the UPS rear panel. If your UPS has a battery fuse instead of a breaker, reinstall the fuse.

    For 8 kVA – 18 kVA UPS models only. Raise the top UPS hinged cover and turn on (|) the input, output, and battery breakers.

18. The UPS may now be turned on according to your Avaya UPS operator's manual.

Important Safeguards

- After you have connected EBCUs to a UPS, do not attempt to lift them or place any unnecessary strain on the battery output connectors.
- Do not connect or disconnect EBCUs while the UPS is operating in Battery mode.
- When connecting or disconnecting EBCUs, verify the circuit breaker on all EBCUs is in the OFF (O) position.

EBCU Fault LED

The Fault LED on the front panel of the EBCU illuminates to indicate an over temperature condition. The Fault LED remains lit until the system cools, typically a few hours.

Alarm Contacts

A set of normally open alarm contacts is provided on the rear panel of the EBCU. The contacts will close if there is an overload or over temperature condition.

Optional: To use the alarm contacts, connect alarm leads to the two contacts on the alarm contact strip. The alarm contact is rated at 300V, 25A.

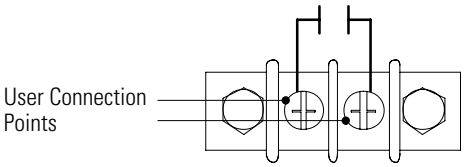

Figure 18. Alarm Contact Strip

CHAPTER 3

SPECIFICATIONS

Table 1. Extended Battery Charger Unit Technical Specifications

Battery Type	Valve-regulated lead acid (VRLA)
Expected Life	8-10 years
Nominal Battery String Voltage	240 Vdc
Nominal Float Voltage	2.3V/cell
Recharge Current	2.2A per 240 Vdc per string
Charger AC Input	6A, 100-120 Vac, 50/60 Hz or 3A, 200-240 Vac, 50/60 Hz
Circuit Protection	Circuit breaker protection
Alarm Contact	300V, 25A
Dimensions (WxDxH)	25.5″ x 28.2″ x 28.1″ (64.8 x 71.6 x 71.4 cm)
Weight	970 lb (440 kg)
Operating Environment	Temperature: 0°C to 35°C (32°F to 95°F) Recommended use: 25°C (77°F); For each 8°C (15°F) rise in temperature, the battery loses approximately 50% of its rated life. Humidity: 5 to 95% (noncondensing)
Agency Approvals	Safety: EN50091-1, EN60950 UL 1778 CAN/CSA-C22.2 No. 107.1-M91 EMC: FCC Part 15 Class A CISPR 22 Class A, EN50091-2 UPS-A EN50082-1, IEC 801-2, -3, -4

Table 2. Parts List

EBCU Model	Avaya Comcode
240 Vdc EBCU	408128098
120 Vdc EBCU Charger	407970870

CHAPTER 4

TROUBLESHOOTING

The Extended Battery Charger Unit is shipped with the battery charged. However, it may lose some of its charge during shipping and storage. You can use the EBCU immediately after unpacking, but it may not provide the full-rated backup time during a power failure. Upon initial startup, the EBCU may need to operate for approximately 24 hours to fully charge the battery and provide full battery-backup time.

Condition	Possible Cause	Action
System does not provide the expected backup time.	One or more EBCU circuit breakers are in the OFF (O) position.	Turn the EBCU circuit breaker to the ON (|) position for all connected EBCUs.
	EBCU is not properly connected to the UPS.	Verify that the EBCU cords are connected.
	Low battery capacity.	Allow the battery to charge for 24 hours, then retest.
	Protected equipment power requirements exceed UPS capacity.	Reduce load, then retest.
Battery indicator on UPS front panel flashes.	Weak battery.	Allow the battery to charge for 24 hours, then retest. Have batteries replaced if condition persists.
	EBCU is not properly connected to the UPS.	Verify that the EBCU cords are connected.
	One or more EBCU circuit breakers were not turned on during installation.	Turn the EBCU circuit breaker to the ON (|) position for all connected EBCUs.
	One or more EBCU circuit breakers opened due to a high temperature condition.	Contact your Avaya service representative.
Charger LED is not on.	EBCU connections are not secure.	Verify that the EBCU is properly connected.
	Charger has failed.	Contact your Avaya service representative.
EBCU Fault LED is lit.	Battery has failed.	Contact your Avaya service representative.
Alarm contact is closed.	Battery has failed or there is an overload condition.	Contact your Avaya service representative.

Obtaining Service

The troubleshooting chart covers most of the difficulties you may encounter during normal operation. If you have any questions or problems with your UPS, call your Avaya service representative or the appropriate telephone number on the service label of your UPS.

Please have the following information ready when you call:

- Model number
- Serial number
- Version number (if available)
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information