NetSure™ +12 VDC Bulk Output Power System

Installation and User Manual, UM588706000

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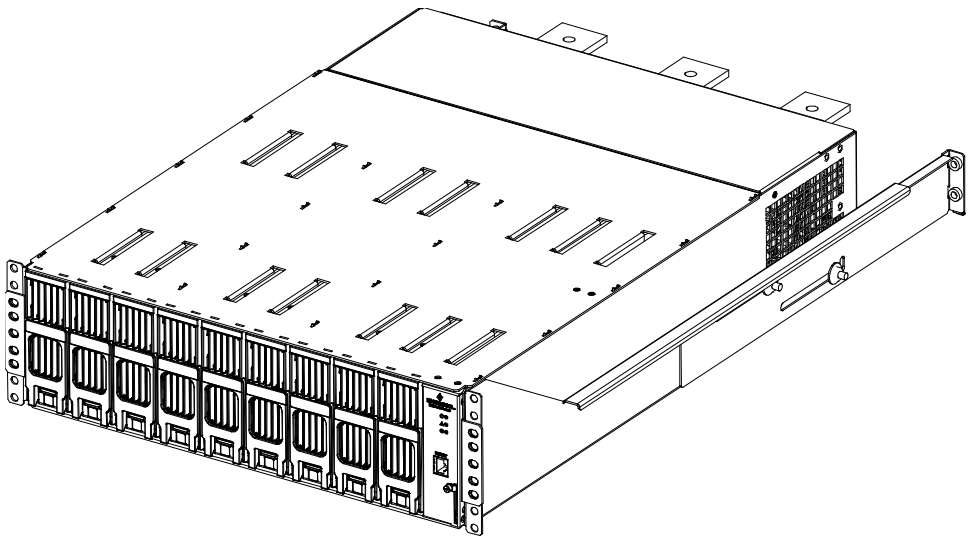
Specification Number: 588706000
Model Number: PSS12/2000-19BC, PSS12/2000-19B



EMERSON
Network Power

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Admonishments Used in this Document

	**DANGER!** Warns of a hazard the reader ***will*** be exposed to that will ***likely*** result in death or serious injury if not avoided. (ANSI, OSHA)
	**WARNING!** Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)
	**CAUTION!** Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)
	**ALERT!** Alerts the reader to an action that ***must be avoided*** in order to protect equipment, software, data, or service. (ISO)
	**ALERT!** Alerts the reader to an action that ***must be performed*** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)
	**FIRE SAFETY!** Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)
	**SAFETY!** Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

Important Safety Instructions

General Safety

DANGER!
YOU MUST FOLLOW APPROVED SAFETY PROCEDURES.

Performing the following procedures may expose you to hazards. These procedures should be performed by qualified technicians familiar with the hazards associated with this type of equipment. These hazards may include shock, energy, and/or burns. To avoid these hazards:

a) The tasks should be performed in the order indicated.

b) Remove watches, rings, and other metal objects.

c) Prior to contacting any uninsulated surface or termination, use a voltmeter to verify that no voltage or the expected voltage is present. Check for voltage with both AC and DC voltmeters prior to making contact.

d) Wear eye protection.

e) Use double insulated tools appropriately rated for the work to be performed.

Voltages

AC Input Voltages

DANGER! This system operates from AC input voltage capable of producing fatal electrical shock. AC input power must be completely disconnected from the branch circuits wiring used to provide power to the system before any AC electrical connections are made. Follow local lockout/tagout procedures to ensure upstream branch circuit breakers remain de-energized during installation. DO NOT apply AC input power to the system until all electrical connections have been completed and checked.

DC Input/Output Voltages

DANGER! This system produces DC Power and may have a battery source connected to it. Although the DC voltage is not hazardously high, the rectifiers and/or battery can deliver large amounts of current. Exercise extreme caution not to inadvertently contact or have any tool inadvertently contact an output terminal or battery terminal or exposed wire connected to an output terminal or battery terminal. NEVER allow a metal object, such as a tool, to contact more than one termination or battery terminal at a time, or to simultaneously contact a termination or battery terminal and a grounded object. Even a momentary short circuit can cause sparking, explosion, and injury.

DANGER! Follow local lockout/tagout procedures to ensure DC branch circuit protection devices remain de-energized during installation at loads, as required.

Battery

BBU Module

WARNING! The BBU module contains lithium-ion battery cells. Handling and storage precautions MUST be observed. Lithium-ion batteries are considered UN/DOT Class 9 Misc Hazardous Materials for shipping purposes. Only properly trained personnel are allowed to ship or receive BBU modules.

The BBU module has no user serviceable parts. The lithium-ion battery pack is embedded inside the unit and is not serviceable.

Disposal of the BBU module should follow established customer waste recycling plans for electronics and battery disposal.

The BBU module must be handled carefully. The BBU module is FRAGILE and contains lithium-ion battery cells. If the BBU module shows ANY sign of mechanical damage or abuse, it must not be used or installed. Damaged cells are hazardous and must be taken out of service immediately.

Hazardous Voltage

DANGER! Hazard of electrical shock. More than one disconnect may be required to de-energize the system before servicing.

Handling Equipment Containing Static Sensitive Components

WARNING! Installation or removal of equipment containing static sensitive components requires careful handling. Before handling any equipment containing static sensitive components, read and follow the instructions contained on the Static Warning Page.

Static Warning

This equipment contains static sensitive components. The warnings listed below must be observed to prevent damage to these components. Disregarding any of these warnings may result in personal injury or damage to the equipment.

1. Strictly adhere to the procedures provided in this document.
2. Before touching any equipment containing static sensitive components, discharge all static electricity from yourself by wearing a wrist strap grounded through a one megohm resistor. Some wrist straps, such as Emerson Network Power Part Number 631810600, have a built-in one megohm resistor; no external resistor is necessary. Read and follow wrist strap manufacturer's instructions outlining use of a specific wrist strap.
3. Do not touch traces or components on equipment containing static sensitive components.
   Handle equipment containing static sensitive components only by the edges that do not have connector pads.
4. After removing equipment containing static sensitive components, place the equipment only on conductive or anti-static material such as conductive foam, conductive plastic, or aluminum foil. Do not use ordinary Styrofoam™ or ordinary plastic.
5. Store and ship equipment containing static sensitive components only in static shielding containers.
6. If necessary to repair equipment containing static sensitive components, wear an appropriately grounded wrist strap, work on a conductive surface, use a grounded soldering iron, and use grounded test equipment.

System Overview

Customer Documentation Package

This document (UM588706000) provides *Installation and User Instructions* for the NetSure™ +12 VDC Bulk Output Power System Model PSS12/2000-19BC and PSS12/2000-19B, Spec. No. 588706000.

The complete Customer Documentation Package consists of…

NetSure™ +12 VDC Bulk Output Power System Installation and User Manual

- NetSure™ +12 VDC Bulk Output Power System Installation and User Instructions: UM588706000
- NetSure™ +12 VDC Bulk Output Power System "System Application Guide": SAG588706000
- NetSure™ SCC Controller Instructions: UM1M520HNA
- NetSure™ Rectifier Module Instructions: UM1R123000
- NetSure™ BBU (Battery Backup Unit) Module Instructions: UM1B123000
- Engineering Drawings

System Description

+12 VDC @ up to 2000 Amperes Bulk Output Power System

The NetSure™ PSS12/2000-19BC Bulk Output Module Mounting Assembly is a complete integrated power system containing rectifiers, BBU's (Battery Backup Units), intelligent control, and monitoring. The NetSure™ PSS12/2000-19B Bulk Output Module Mounting Assembly is a companion expansion assembly.

A system consists of the following components.

Note: *The installation may consist of one (1) main module mounting assembly and up to two (2) expansion module mounting assemblies, or all main module mounting assemblies. In installations with one main module mounting assembly and up to two expansion module mounting assemblies, all module mounting assemblies are on one DC bus and are controlled by a single SCC controller. A common CAN bus is shared across all module mounting assemblies and all rectifiers load share and all rectifiers are load managed via the SCC. In installations with all main module mounting assemblies, each module mounting assembly is on a separate DC bus and each module mounting assembly is controlled by (contains) a separate SCC controller. A separate CAN bus exists per module mounting assembly, rectifiers load share per module mounting assembly, and rectifiers are load managed via an SCC per module mounting assembly.*

Main Module Mounting Assembly (N+1 Redundant)

The main module mounting assembly houses up to nine (9) modules, plus the SCC controller. Modules can be a combination of rectifier modules and BBU (Battery Backup Unit) modules, depending on the AC input configuration. See SAG588706000 for restrictions.

SCC (System Control Card) Controller: The controller provides power system control, monitoring functions, and local/remote alarm functions. The controller also provides data acquisition, system alarm management, and advanced battery management. The controller provides an Ethernet port for remote access. It also comes with SNMP capability for remote system management. Operation of the SCC controller requires a master upstream supervisory and control unit, such as the Avocent UMG, connected to the system's Ethernet port and utilizing an SNMP interface. Refer to the SCC Controller Instructions (UM1M520HNA) for more information.

Note: *The rectifier and BBU modules will continue to operate if the SCC controller fails. The rectifier and BBU modules will work if the system is powered up without an SCC controller; however, an SCC controller is required to get any monitoring/status information from the system. The application should be designed with an SCC controller.*

Expansion Module Mounting Assembly (N+1 Redundant)

Each expansion module mounting assembly houses up to nine (9) modules. Modules can be a combination of rectifier modules and BBU (Battery Backup Unit) modules, depending on the AC input configuration. See SAG588706000 for restrictions.

Rectifier Modules

The system may contain rectifier modules, which provide load power. Refer to the Rectifier Instructions (UM1R123000) for more information.

BBU (Battery Backup Unit) Modules

The system may contain BBU modules, which provide power during AC utility failures, and can provide additional power on demand. Each BBU module is equipped with a rectifier / charger, a lithium-ion battery pack, and a 12 VDC converter. The BBU module is designed to provide 3 kW of 12 VDC power for a minimum of 90 seconds, per module. Refer to the BBU Instructions (UM1B123000) for more information.

Installation Acceptance Checklist

Provided below is an Installation Acceptance Checklist. This checklist helps ensure proper installation and initial operation of the system. As the procedures presented in this document are completed, check the appropriate box in this list. If the procedure is not required for your installation site, also check the box in this list to indicate that the procedure was read. When installation is done, ensure that each block in this list has been checked.

Note: *The system is not powered up until the end of this checklist.*

Note: *Some of these procedures may have been performed at the factory for you.*

Installing the System

- ❑ Equipment Inspection Completed
- ❑ Module Mounting Assembly(s) Mounted in an IT Rack

Making Electrical Connections

- ❑ System Frame Grounding Connection Made
- ❑ +12 VDC Output Connections Made
- ❑ External Alarm, Reference, Monitoring, and Control Connections Made
- ❑ SCC Controller Ethernet Connection Made
- ❑ Module Mounting Assemblies Interconnections Made, as required
- ❑ AC Input and AC Input Equipment Grounding Connections Made

Installing the Modules

- ❑ Rectifier Modules Installed, as required
- ❑ BBU Modules Installed, as required

Initially Starting the System

- ❑ System Started, Configured, and Checked

Installing the System

General Requirements

- This product is intended only for installation in a restricted access location on or above a non-combustible surface.
- This product must be located in a controlled environment with access to crafts persons only.
- This product is intended for installation in data centers or network telecommunication facilities (CO, vault, hut, or other environmentally controlled electronic equipment enclosure).
- This product is intended to be installed in a data center facility and be connected to a MESH-bonding network (MESH-BN) or to the common bonding network in a network telecommunication facility (CO, vault, hut, or other environmentally controlled electronic equipment enclosure).
- This system is suitable for installation as part of the Common Bonding Network (CBN) or a data center building MESH-bonding network (MESH-BN).
- The installer should be familiar with the installation requirements and techniques to be used in mounting the module mounting assembly(s) onto the mounting rails of an IT rack.
- Rectifier module, BBU module, and module mounting assembly ventilating openings must not be blocked and temperature of air entering these must not exceed rated operating ambient temperature range found in SAG588706000.
- Clearance requirements are:
  a. Recommended minimum space clearance for the front of each module mounting assembly is 80 mm (3 inches).
  b. Recommended minimum space clearance for the rear of each module mounting assembly is 80 mm (3 inches).
  c. Module mounting assemblies may be stacked together, with no space between them.

Inspecting the Equipment and Storing for Delayed Installations

Inspecting the Equipment

General

Compare the contents of the shipment with the bill of lading. Report any missing items to the carrier and your local Emerson representative immediately.

While the system is still on the truck, inspect the equipment and shipping container(s) for any signs of damage or mishandling.

As the equipment is moved off the truck and unpacked, visually examine the system for transit damage.

Do not attempt to install the system if damage is apparent.

If any damage is noted, file a damage claim with the shipping agency within 24 hours and contact Emerson Network Power (see "NetPerform™ Optimization Services" on page 23 for contact information) to inform them of the damage claim and the condition of the equipment.

BBU (Battery Backup Unit)

Precautions for the BBU to ensure safe arrival have been taken including UN/DOT packaging. If the packaging material is damaged, identify the unit and see if the device has damage. If the unit is physically damaged, contact Emerson Network Power (see "NetPerform™ Optimization Services" on page 23 for contact information) to inform them of the damage and the condition of the equipment.

Note: *The BBU should never be opened without Emerson Network Power approval, and should not be destroyed. Do not attempt to use or install this BBU if any of abnormal conditions such as deformation of shape, or unusual smell.*

BBU Storage Maintenance Charge

When the BBU is not plugged into a rack, there will be no external LEDs illuminated to conserve power. If BBU's are stored, they will periodically need a refreshing charge. Refer to the BBU Instructions (UM1B123000) for more information.

Securing the Module Mounting Assembly(s) to the Mounting Rails of an IT Rack

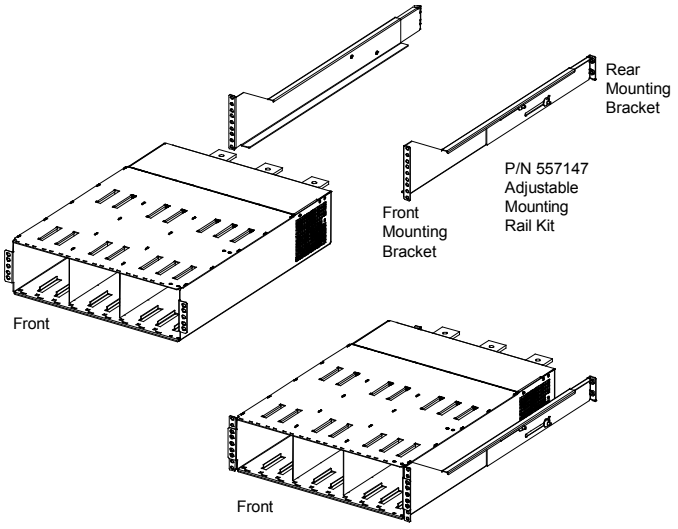
Install the module mounting assembly(s) into a 19" mounting frame of an IT rack as follows.

List 1-8, 11-18, 21-22, 31-32 Procedure

Refer to Figure 1.

1. Install P/N 557147 adjustable mounting rail kit onto the frames of an IT rack. Secure the mounting rails to the IT rack with the furnished cage nuts and screws at both the front and rear brackets. Use only the top two and bottom two mounting holes on the front mounting bracket.
2. Slide the module mounting assembly into the front of the IT rack, resting the bottom of the module mounting assembly on the mounting rails installed in the IT rack.
3. Secure the front mounting flanges to the IT rack with the furnished cage nuts and screws.

Figure 1. Mounting the Module Mounting Assembly - List 1-8, 11-18, 21-22, 31-32

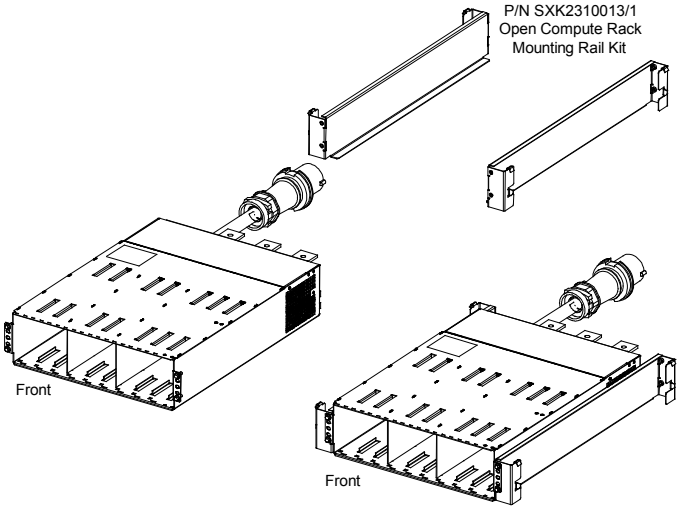


List 9, 19 Procedure

Refer to Figure 2.

1. Install P/N SXK2310013/1 rack mounting rail kit onto the frames of an Open Compute IT rack.
2. Slide the module mounting assembly into the front of the IT rack, resting the bottom of the module mounting assembly on the mounting rails installed in the IT rack.
3. Secure the front mounting flanges to the IT rack with the furnished cage nuts and screws.

Figure 2. Mounting the Module Mounting Assembly - List 9, 19



Making Electrical Connections

Important Safety Instructions

DANGER! Adhere to the "Important Safety Instructions" presented at the front of this document.

Wiring Considerations

All wiring should follow the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), and applicable local codes. For operation in countries where the NEC is not recognized, follow applicable codes.

For wire size, branch circuit protection, crimp lug, and general wiring recommendations; refer to System Application Guide SAG588706000.

Refer to drawing 031110100 for lug crimping information. Refer to drawings 031110200 and 031110300 for additional lug information.

Power System Frame Grounding Connection

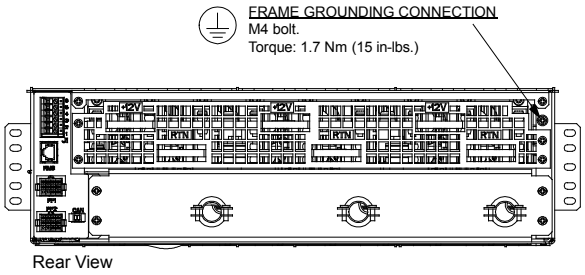
For system frame grounding requirements, refer to the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), applicable local codes, and your specific site requirements. For operation in countries where the NEC is not recognized, follow applicable codes.

A customer's frame grounding network lead can be attached to the rear of each module mounting assembly as shown in Figure 3. Provision is made for installing a lead with a one-hole lug that has an M4 bolt clearance hole.

Note: *This product is intended to be installed in a data center facility and be connected to a MESH-bonding network (MESH-BN) or to the common bonding network in a network telecommunication facility (CO, vault, hut, or other environmentally controlled electronic equipment enclosure).*

Note: *This system is suitable for installation as part of the Common Bonding Network (CBN) or a data center building MESH-bonding network (MESH-BN).*

Figure 3. Power System Frame Grounding Connection



+12 VDC Output Connections

Important Safety Instructions

DANGER! Adhere to the "Important Safety Instructions" presented at the front of this document.

WARNING! Observe proper polarity when making output connections.

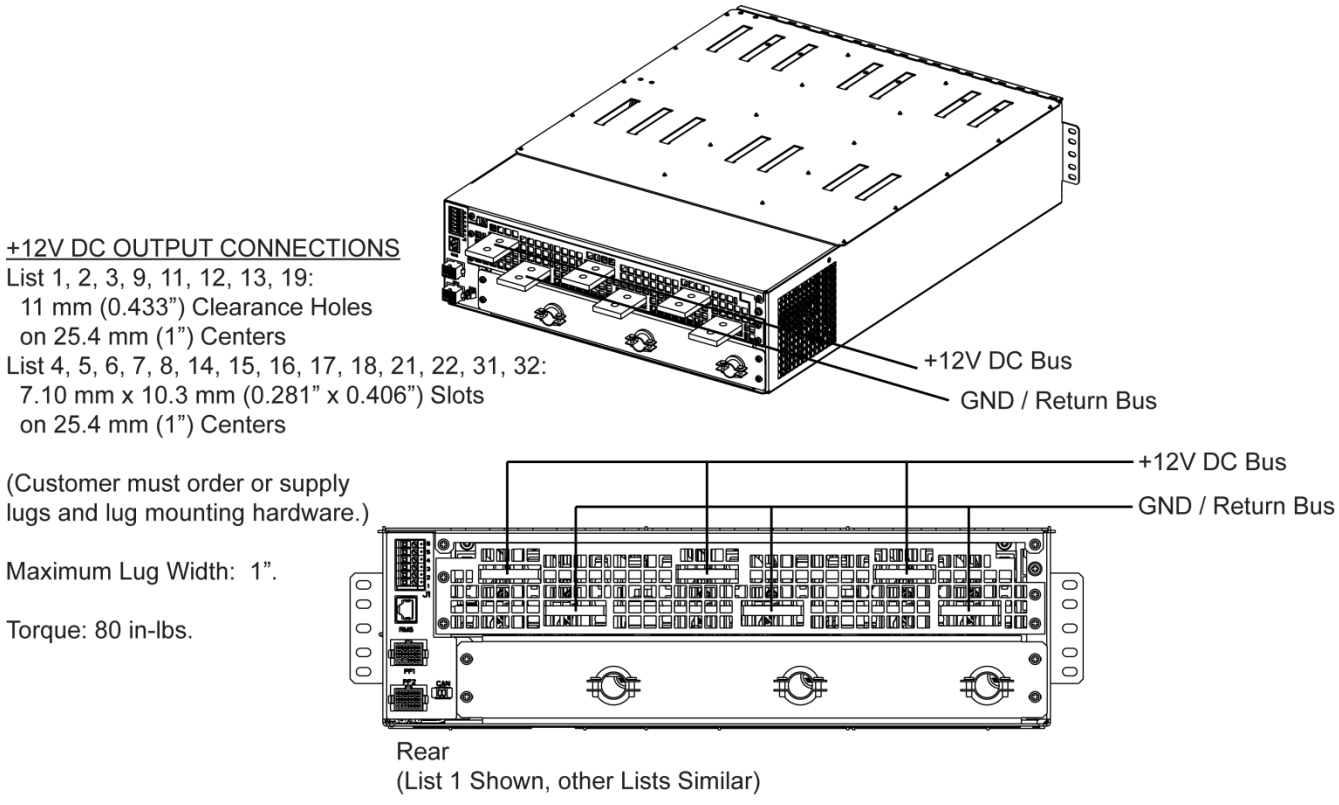
General

Note: *The system is intended to be negative pole grounded (+12 VDC). Field provide a properly sized DC power return wire to earth reference from the GND/RETURN busbar to Earth.*

Note: *The installation may consist of one (1) main module mounting assembly and up to two (2) expansion module mounting assemblies, or all main module mounting assemblies. In installations with one main module mounting assembly and up to two expansion module mounting assemblies, all module mounting assemblies are on one DC bus and are controlled by a single SCC controller. A common CAN bus is shared across all module mounting assemblies and all rectifiers load share and all rectifiers are load managed via the SCC. In installations with all main module mounting assemblies, each module mounting assembly is on a separate DC bus and each module mounting assembly is controlled by (contains) a separate SCC controller. A separate CAN bus exists per module mounting assembly, rectifiers load share per module mounting assembly, and rectifiers are load managed via an SCC per module mounting assembly.*

DC output leads are connected to the output busbars located on the back of the module mounting assembly(s) as shown in Figure 4. These busbars provide clearance holes or slots for installation of customer-provided two hole lugs. Customer must order or supply lugs and lug mounting hardware.

Figure 4. +12 VDC Output Connections

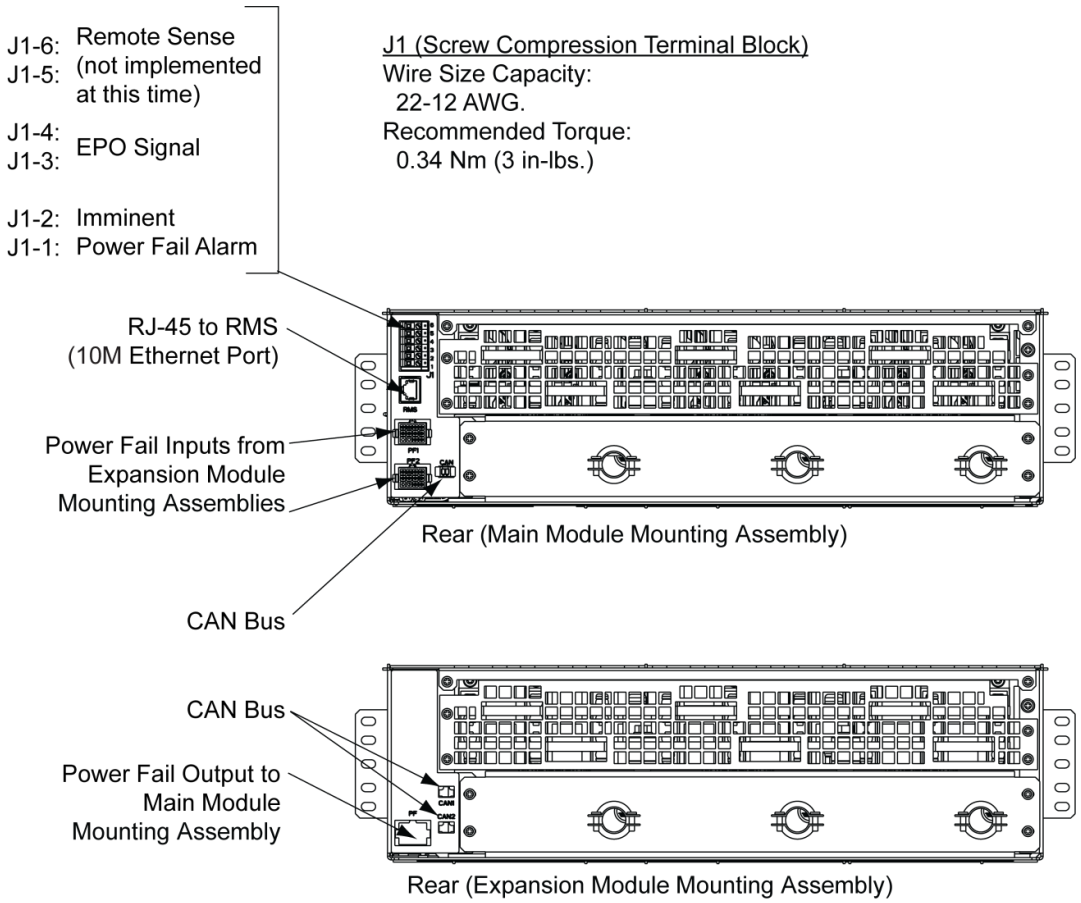


External Alarm, Reference, Monitoring, and Control Connections

EXTERNAL ALARM, REFERENCE, MONITORING, AND CONTROL CONNECTION POINTS LOCATIONS

Refer to Figure 5.

Figure 5. External Alarm, Reference, Monitoring, and Control Connection Points Locations



REMOTE SENSE (NOT IMPLEMENTED AT THIS TIME)

Connect remote sense leads to J1-5 and J1-6, if desired. Observe correct polarity. Refer to Figure 5.

EPO SIGNAL

Connect a normally open external EPO (Emergency Power Off) switch to J1-3 and J1-4, if desired. Switch closure causes the SCC controller to send an SNMP trap, wait two (2) seconds, and then send a message to shut down the rectifiers and BBU's. Refer to Figure 5.

IMMINENT POWER FAIL ALARM

Contacts close between J1-1 and J1-2 when an imminent power fail alarm occurs. This alarm signals when the combination of rectifiers and batteries on the bus can no longer support the load. Refer to Figure 5 and SCC Controller Instructions (UM1M520HNA) for details.

SCC CONTROLLER ETHERNET CONNECTION

Connect the SCC controller's Ethernet port (labeled RMS) to an RMS (Rack Management System). Refer to Figure 5.

Note: *The SCC controller supports a 10M Ethernet connection.*

System Interconnections

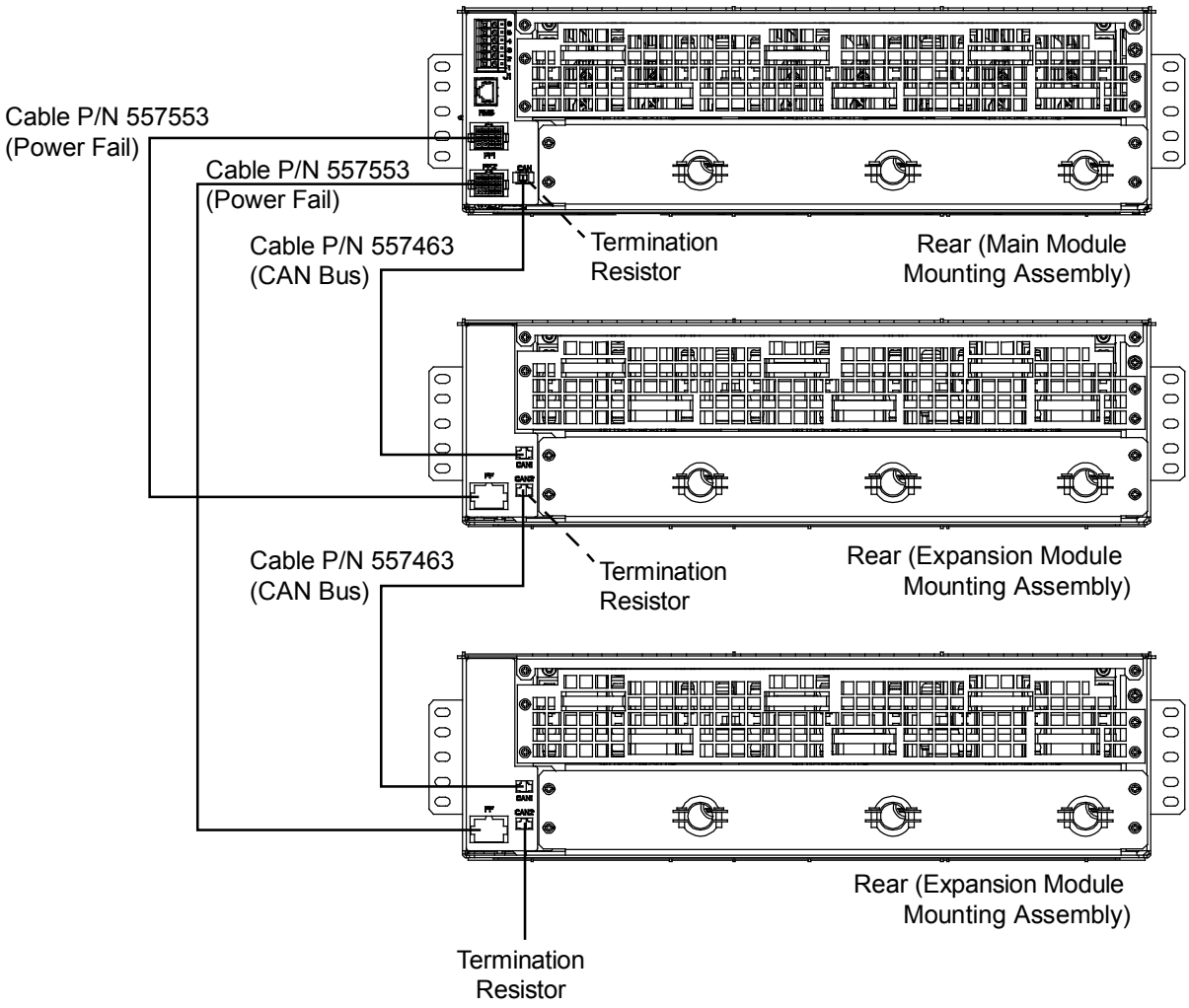
Note: *The installation may consist of one (1) main module mounting assembly and up to two (2) expansion module mounting assemblies, or all main module mounting assemblies. In installations with one main module mounting assembly and up to two expansion module mounting assemblies, all module mounting assemblies are on one DC bus and are controlled by a single SCC controller. A common CAN bus is shared across all module mounting assemblies and all rectifiers load share and all rectifiers are load managed via the SCC. In installations with all main module mounting assemblies, each module mounting assembly is on a separate DC bus and each module mounting assembly is controlled by (contains) a separate SCC controller. A separate CAN bus exists per module mounting assembly, rectifiers load share per module mounting assembly, and rectifiers are load managed via an SCC per module mounting assembly.*

Note: *These connections are not to be made between multiple main module mounting assemblies (containing SCC controllers).*

Refer to Figure 6 for a system interconnection diagram.

As each module mounting assembly is interconnected, remove the termination resistor from the main module mounting assembly and plug it into the appropriate connector on the last module mounting assembly as shown in Figure 6.

Figure 6. System Interconnection Diagram



AC Input and AC Input Equipment Grounding Connections to Module Mounting Assembly(s)

DANGER! Adhere to the "Important Safety Instructions" presented at the front of this document.

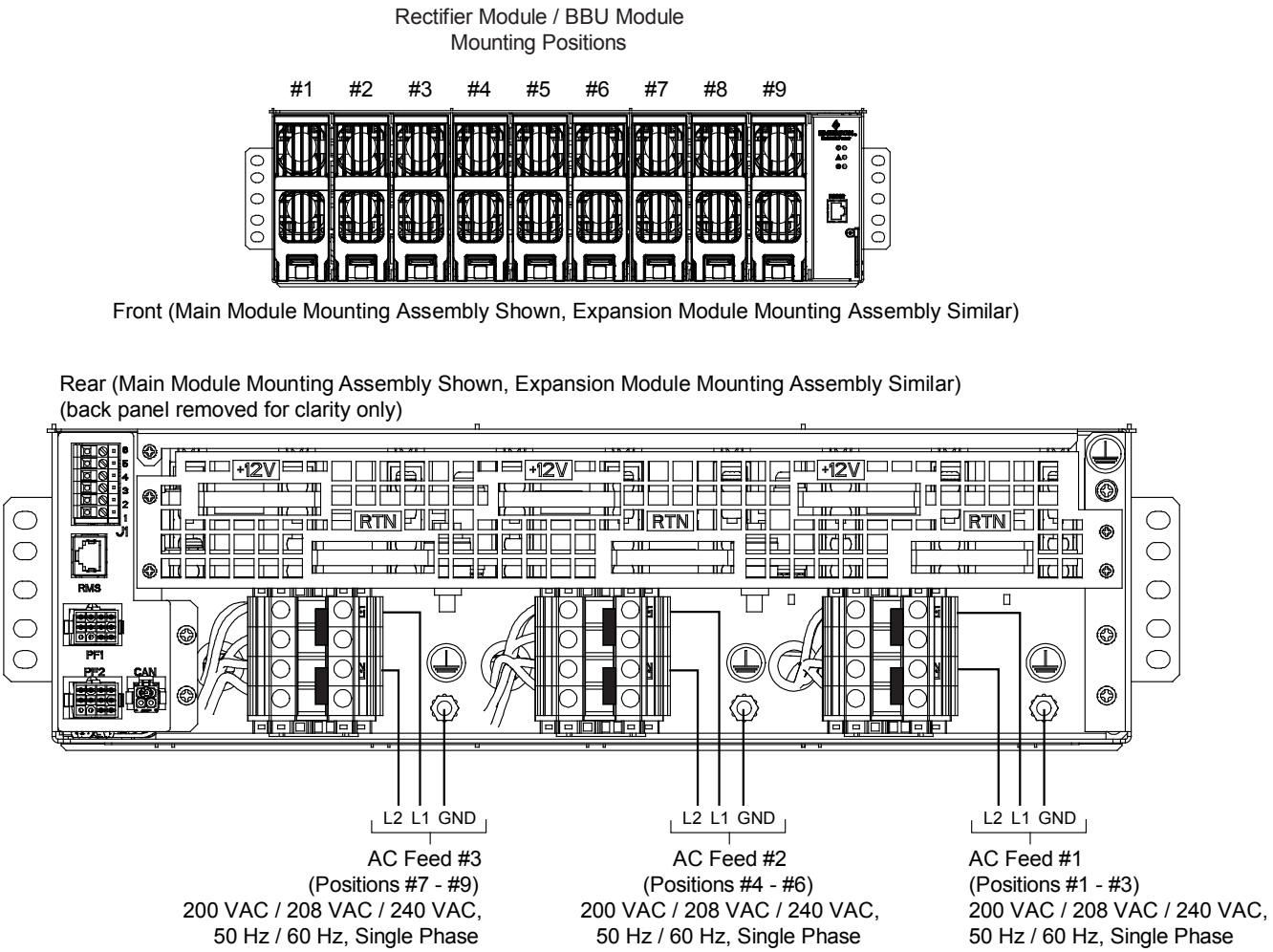
Note: *A grounding conductor must be provided with each AC input feed.*

Connections to List 1, 11 Module Mounting Assembly

Spec. No. 588706000 List 1, 11 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains three cord grips. Refer to Figure 7 for wiring details.

Figure 7. AC Input Connections to a 588706000 List 1, 11 Module Mounting Assembly

AC Input Connections, 588706000 List 1, 11
Nominal 200 VAC / 208 VAC / 240 VAC, 50 Hz / 60 Hz, Single Phase, 3 Feeds per Module Mounting Assembly
(1 Feed per 3 Module Positions)

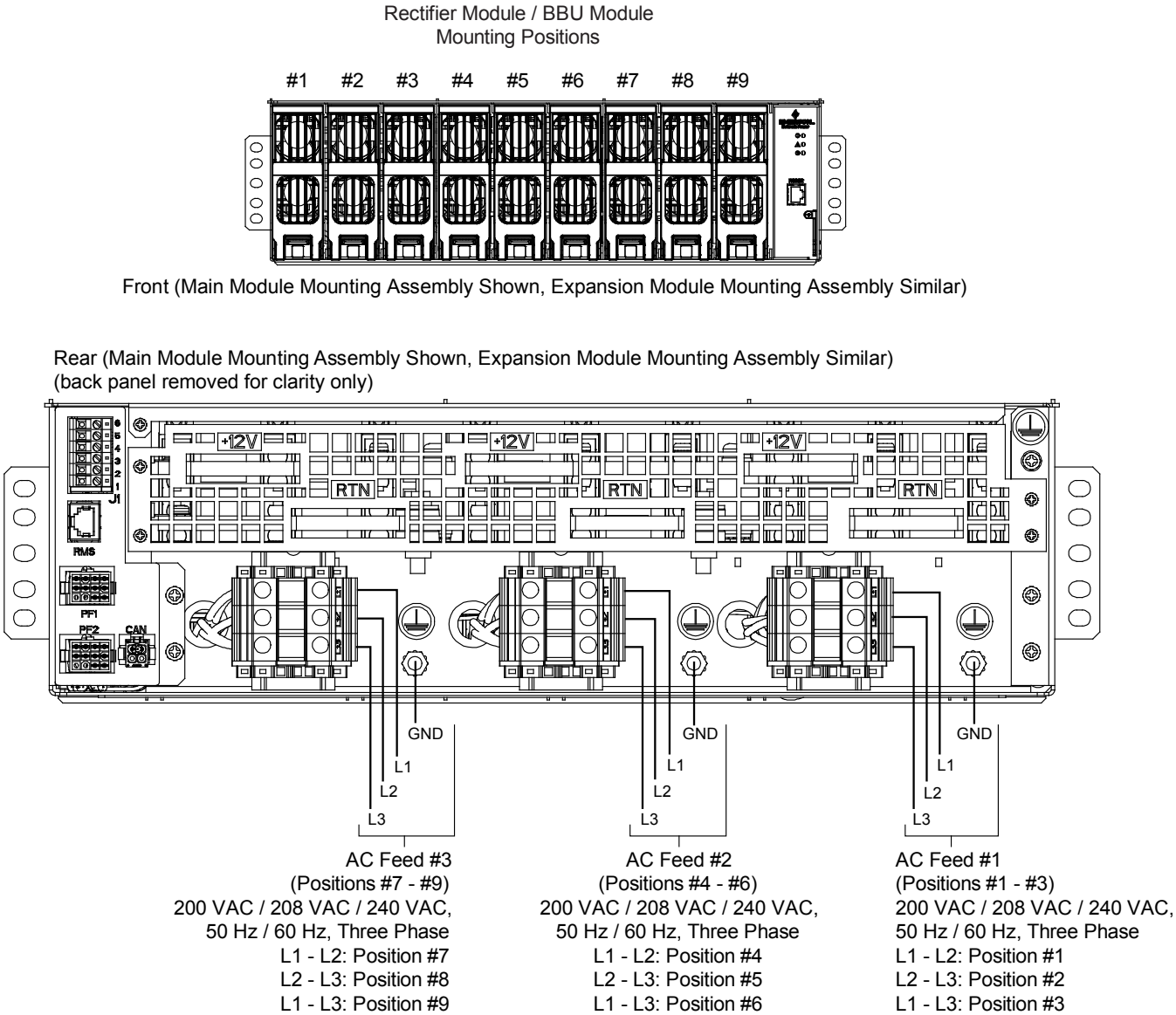


Connections to List 2, 12 Module Mounting Assembly

Spec. No. 588706000 List 2, 12 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains three cord grips. Refer to Figure 8 for wiring details.

Figure 8. AC Input Connections to a 588706000 List 2, 12 Module Mounting Assembly

AC Input Connections, 588706000 List 2, 12
Nominal 200 VAC / 208 VAC / 240 VAC, 50 Hz / 60 Hz, 3-Phase, 3 Feeds per Module Mounting Assembly
(1 Feed per 3 Module Positions)

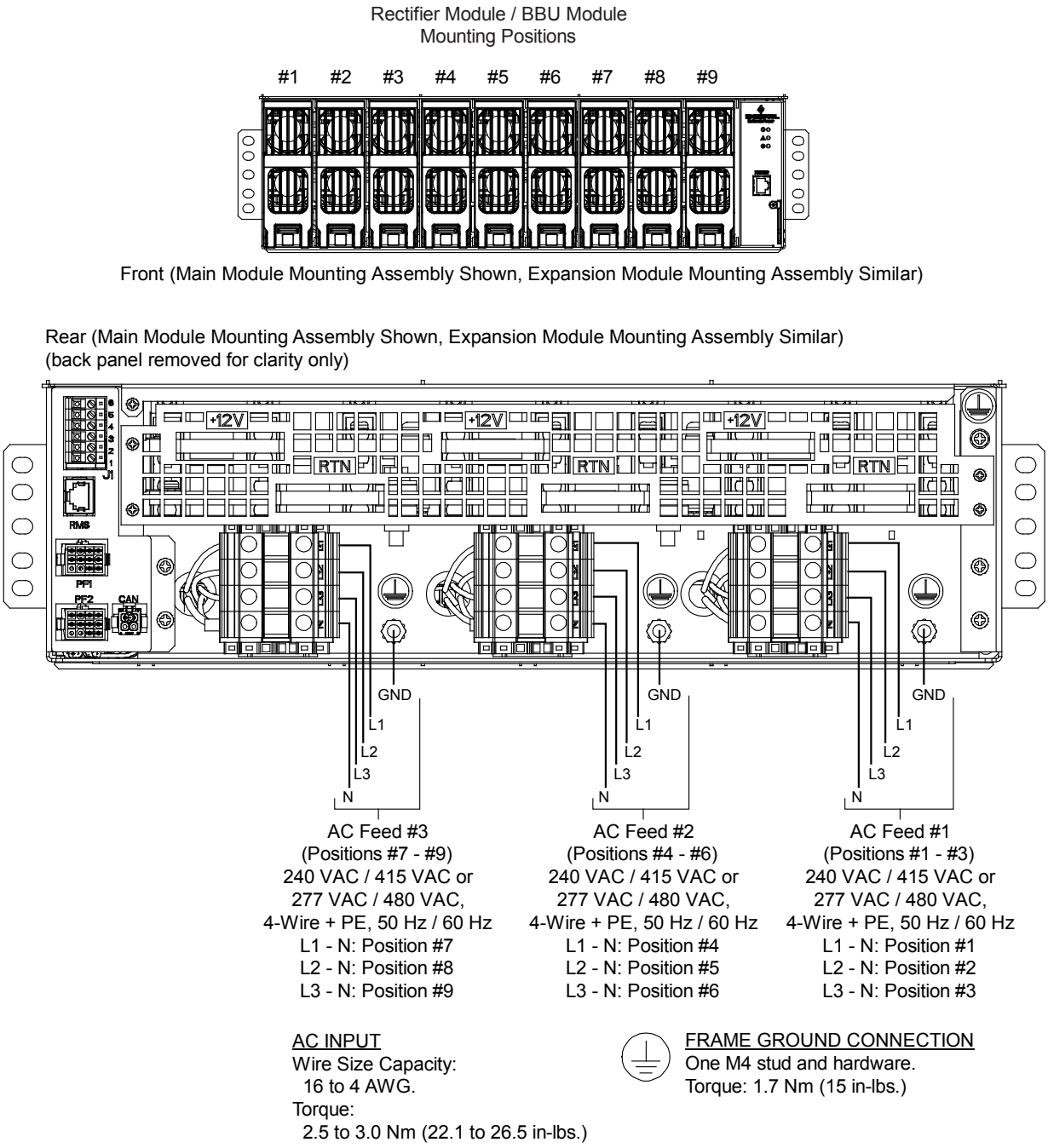


Connections to List 3, 13 Module Mounting Assembly

Spec. No. 588706000 List 3, 13 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains three cord grips. Refer to Figure 9 for wiring details.

Figure 9. AC Input Connections to a 588706000 List 3, 13 Module Mounting Assembly

AC Input Connections, 588706000 List 3, 13
Nominal 240 VAC / 415 VAC or 277 VAC / 480 VAC, 4-Wire + PE, 50 Hz / 60 Hz, 1 Feed per Module Mounting Assembly
(1 Feed per 3 Module Positions)



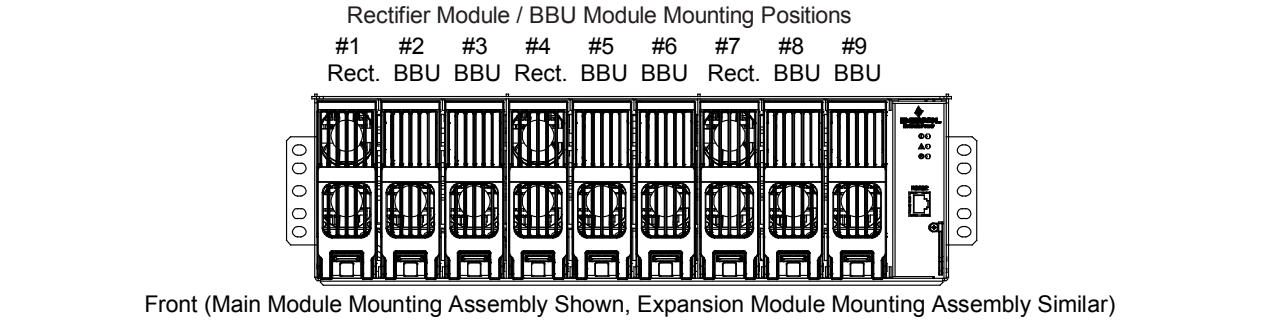
Connections to List 4, 14 Module Mounting Assembly

Spec. No. 588706000 List 4, 14 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains three cord grips. Refer to Figure 10 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 10. DO NOT populate slots in any other arrangement than what is shown in Figure 10. Failure to follow this requirement could result in tripping of AC input protection devices.

Figure 10. AC Input Connections to a 588706000 List 4, 14 Module Mounting Assembly

AC Input Connections, 588706000 List 4, 14
Nominal 200 VAC / 208 VAC / 240 VAC, 50 Hz / 60 Hz, Single Phase, 3 Feeds per Module Mounting Assembly
(1 Feed per 3 Module Positions)



AC INPUT
Wire Size Capacity:
16 to 4 AWG.
Torque:
2.5 to 3.0 Nm (22.1 to 26.5 in-lbs.)

FRAME GROUND CONNECTION
One M4 stud and hardware.
Torque: 1.7 Nm (15 in-lbs.)

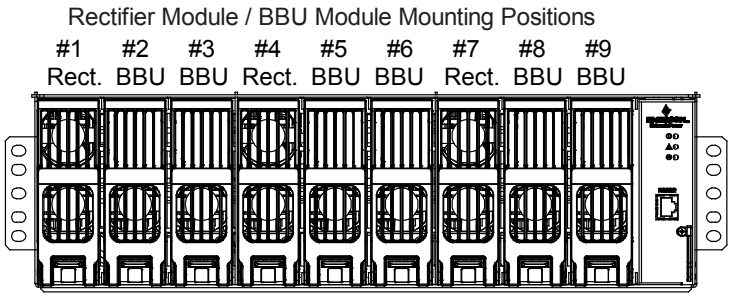
Connections to List 5, 15 Module Mounting Assembly

Spec. No. 588706000 List 5, 15 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains one 1/2" conduit fitting. Refer to Figure 11 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 11. DO NOT populate slots in any other arrangement than what is shown in Figure 11. Failure to follow this requirement could result in tripping of AC input protection devices.

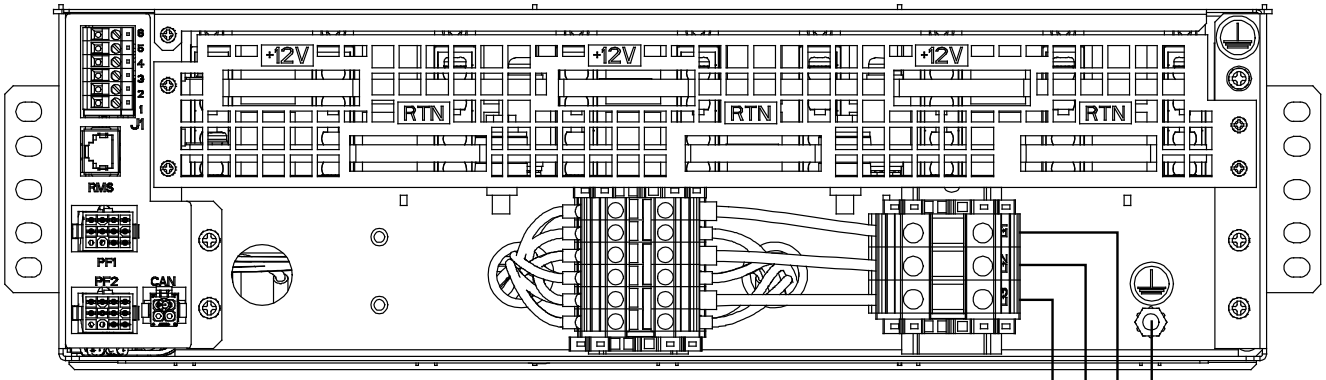
Figure 11. AC Input Connections to a 588706000 List 5, 15 Module Mounting Assembly

AC Input Connections, 588706000 List 5, 15
Nominal 200 VAC / 208 VAC / 240 VAC, 50 Hz / 60 Hz, 3-Phase, 1 Feed per Module Mounting Assembly
(1 Feed per 9 Module Positions)



Front (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)

Rear (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)
(back panel removed for clarity only)



AC INPUT
Wire Size Capacity:
16 to 4 AWG.
Torque:
2.5 to 3.0 Nm (22.1 to 26.5 in-lbs.)

FRAME GROUND CONNECTION
One M4 stud and hardware.
Torque: 1.7 Nm (15 in-lbs.)

GND
L1
L2
L3

AC Feed #1
(Positions #1 - #9)
200 VAC / 208 VAC / 240 VAC,
50 Hz / 60 Hz, Three Phase
L1 - L2: Position #1 - #3
L2 - L3: Position #4 - #7
L1 - L3 : Position #7 - #9

Connections to List 6, 16 Module Mounting Assembly

Spec. No. 588706000 List 6, 16 Module Mounting Assembly provides AC input terminal blocks behind a rear access panel. The rear access panel contains one 1/2" conduit fitting. Refer to Figure 12 for wiring details.

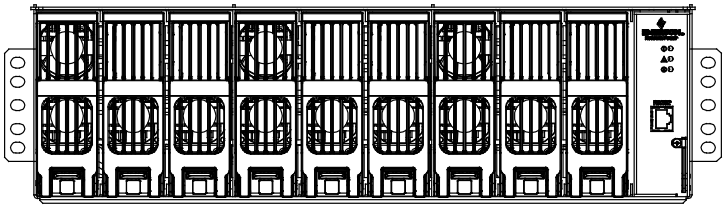
CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 12. DO NOT populate slots in any other arrangement than what is shown in Figure 12. Failure to follow this requirement could result in tripping of AC input protection devices.

Figure 12. AC Input Connections to a 588706000 List 6, 16 Module Mounting Assembly

AC Input Connections, 588706000 List 6, 16
Nominal 240 VAC / 415 VAC or 277 VAC / 480 VAC, 4-Wire + PE, 50 Hz / 60 Hz, 1 Feed per Module Mounting Assembly
(1 Feed per 9 Module Positions)

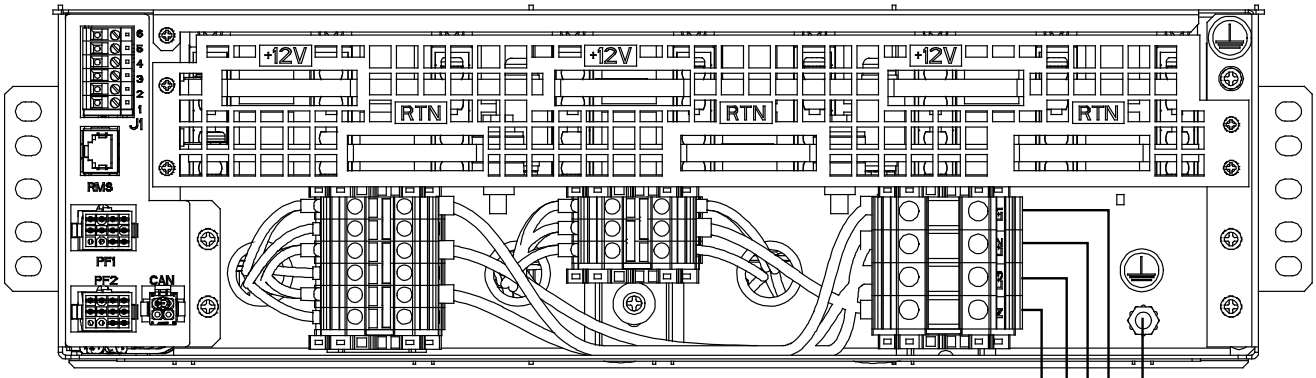
Rectifier Module / BBU Module Mounting Positions

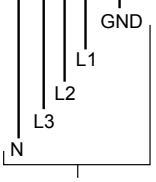
#1	#2	#3	#4	#5	#6	#7	#8	#9
Rect.	BBU	BBU	Rect.	BBU	BBU	Rect.	BBU	BBU



Front (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)

Rear (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)
(back panel removed for clarity only)





AC Feed #1
(Positions #1 - #9)
240 VAC / 415 VAC or 277 VAC / 480 VAC,
4-Wire + PE, 50 Hz / 60 Hz
L1 - N: Position #1 - #3
L2 - N: Position #4 - #6
L3 - N: Position #7 - #9

AC INPUT
Wire Size Capacity:
16 to 4 AWG.
Torque:
2.5 to 3.0 Nm (22.1 to 26.5 in-lbs.)

FRAME GROUND CONNECTION
One M4 stud and hardware.
Torque: 1.7 Nm (15 in-lbs.)

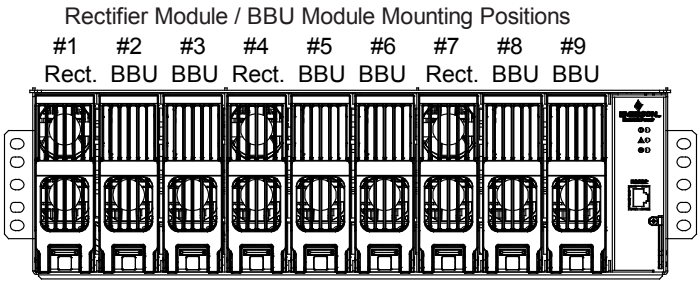
Connections to List 7, 17 Module Mounting Assembly

Spec. No. 588706000 List 7, 17 Module Mounting Assembly provides an AC input line cord and plug. Refer to Figure 13 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 13. DO NOT populate slots in any other arrangement than what is shown in Figure 13. Failure to follow this requirement could result in tripping of AC input protection devices.

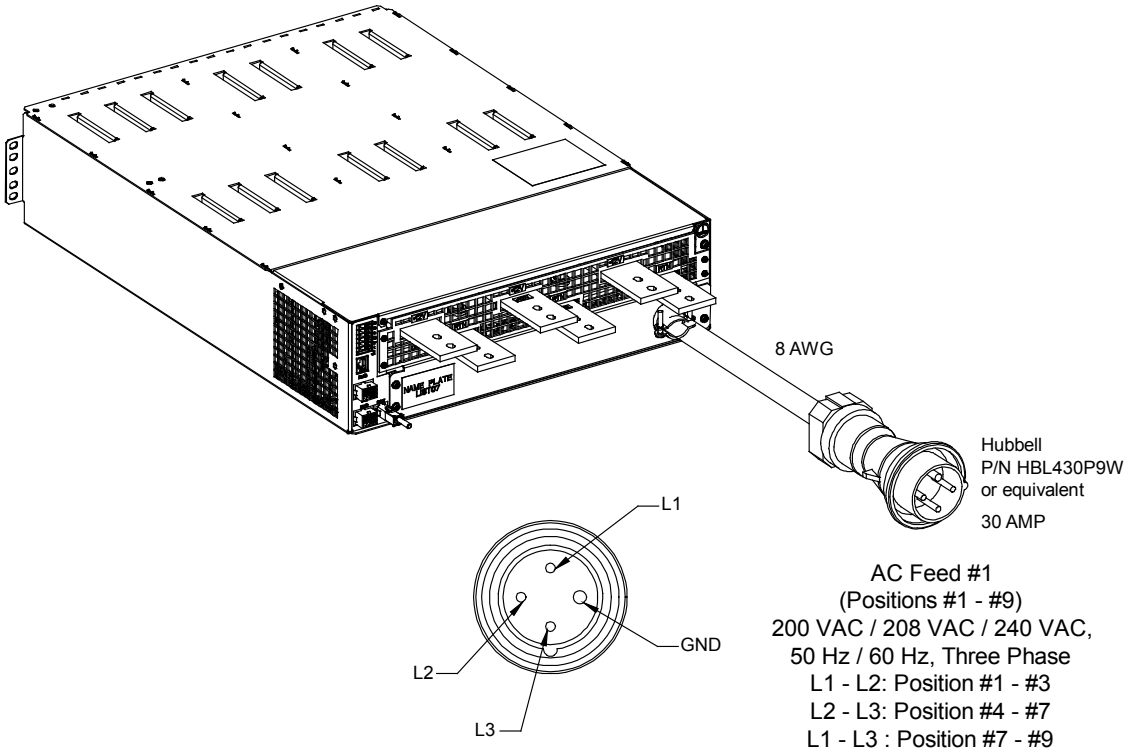
Figure 13. AC Input Connections to a 588706000 List 7, 17 Module Mounting Assembly

AC Input Connections, 588706000 List 7, 17
Nominal 200 VAC / 208 VAC / 240 VAC, 50 Hz / 60 Hz, 3-Phase, 1 Feed per Module Mounting Assembly
(1 Feed per 9 Module Positions)



Front (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)

Rear (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)



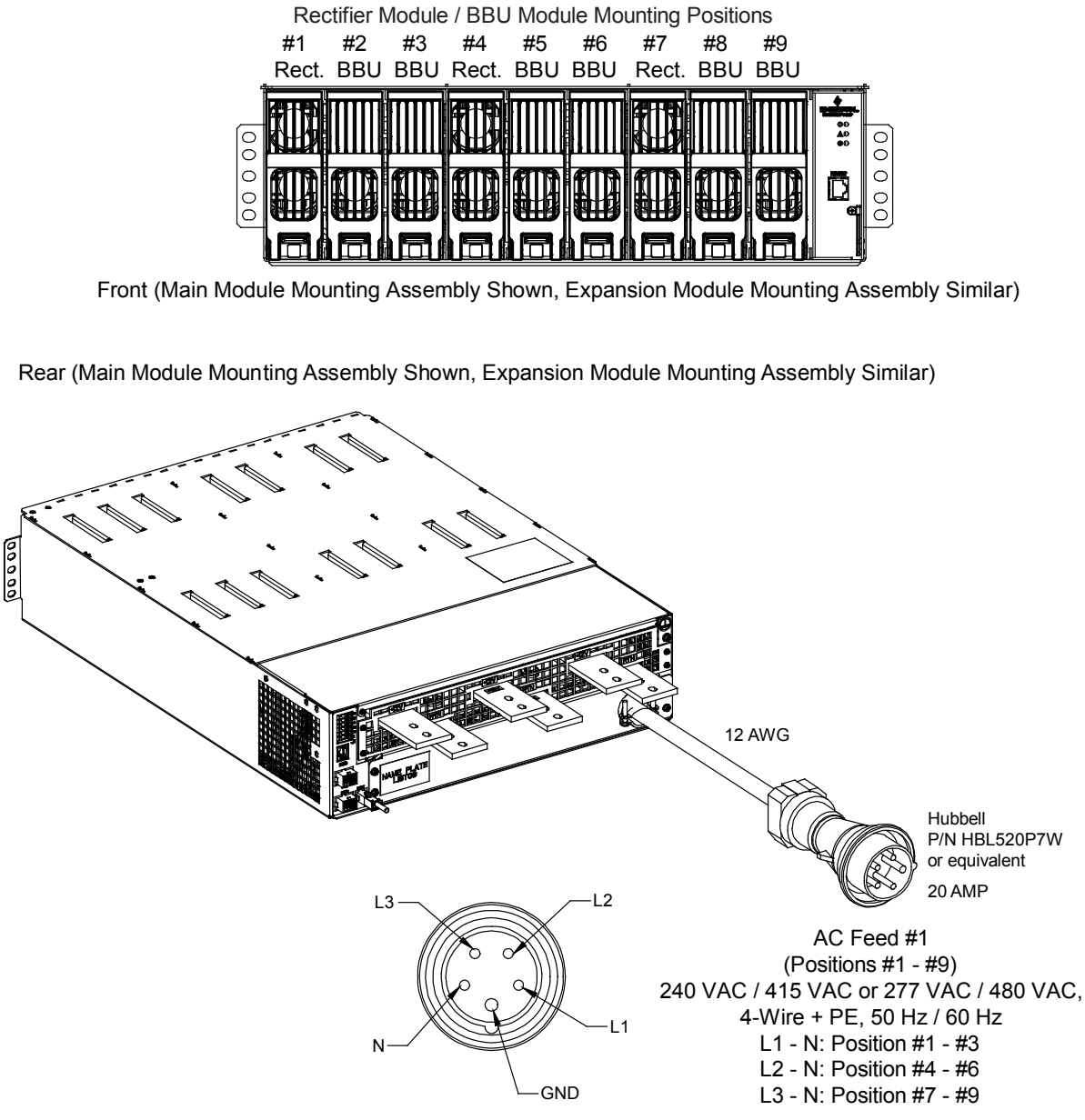
Connections to List 8, 18 Module Mounting Assembly

Spec. No. 588706000 List 8, 18 Module Mounting Assembly provides an AC input line cord and plug. Refer to Figure 14 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 14. DO NOT populate slots in any other arrangement than what is shown in Figure 14. Failure to follow this requirement could result in tripping of AC input protection devices.

Figure 14. AC Input Connections to a 588706000 List 8, 18 Module Mounting Assembly

AC Input Connections, 588706000 List 8, 18
Nominal 240 VAC / 415 VAC or 277 VAC / 480 VAC, 4-Wire + PE, 50 Hz / 60 Hz, 1 Feed per Module Mounting Assembly
(1 Feed per 9 Module Positions)



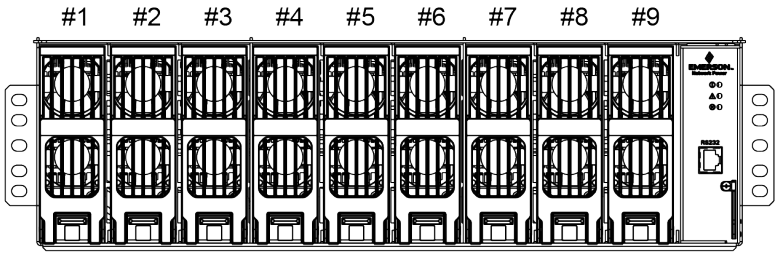
Connections to List 9, 19 Module Mounting Assembly

Spec. No. 588706000 List 9, 19 Module Mounting Assembly provides an AC input line cord and plug. Refer to Figure 15 for wiring details.

Figure 15. AC Input Connections to a 588706000 List 9, 19 Module Mounting Assembly

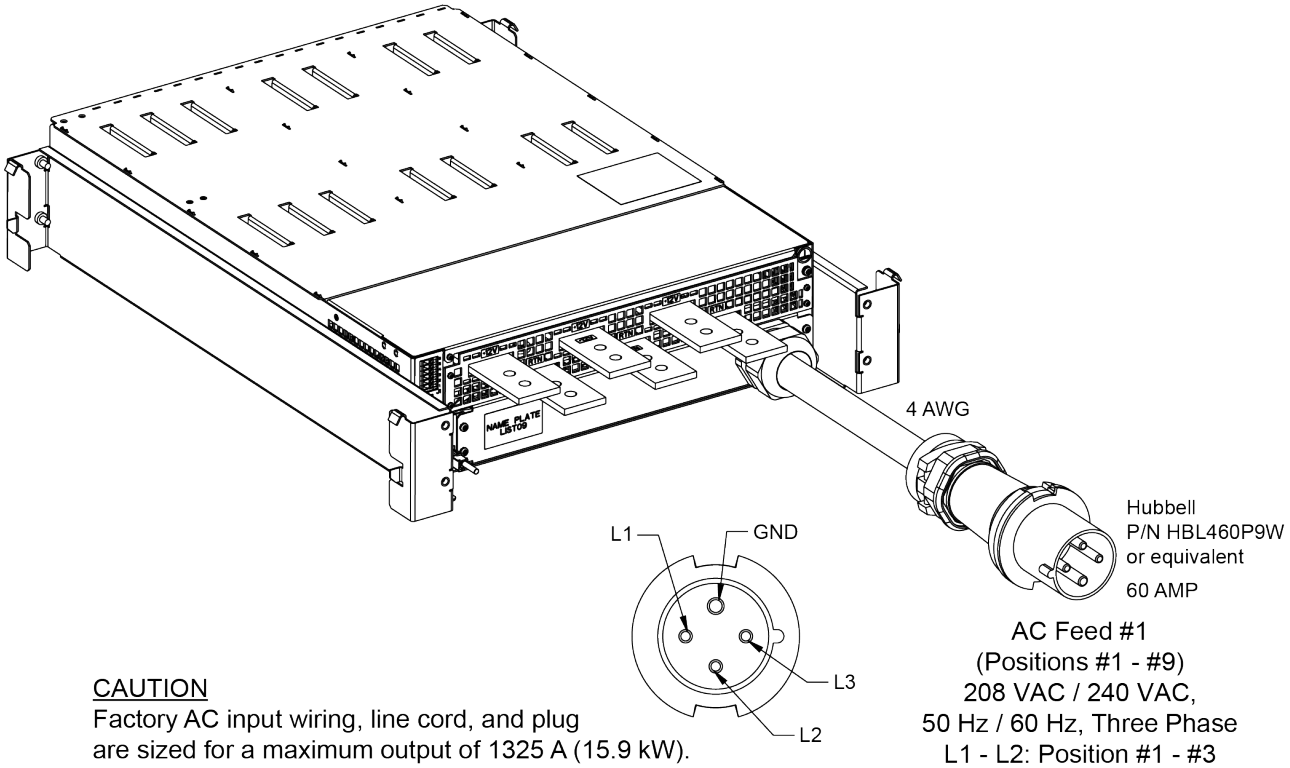
AC Input Connections, 588706000 List 9, 19
Nominal 208 VAC / 240 VAC, 50 Hz / 60 Hz, 3-Phase, 1 Feed per Module Mounting Assembly
(1 Feed per 9 Module Positions)

Rectifier Module / BBU Module
Mounting Positions



Front (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)

Rear (Main Module Mounting Assembly Shown, Expansion Module Mounting Assembly Similar)



CAUTION
Factory AC input wiring, line cord, and plug are sized for a maximum output of 1325 A (15.9 kW).

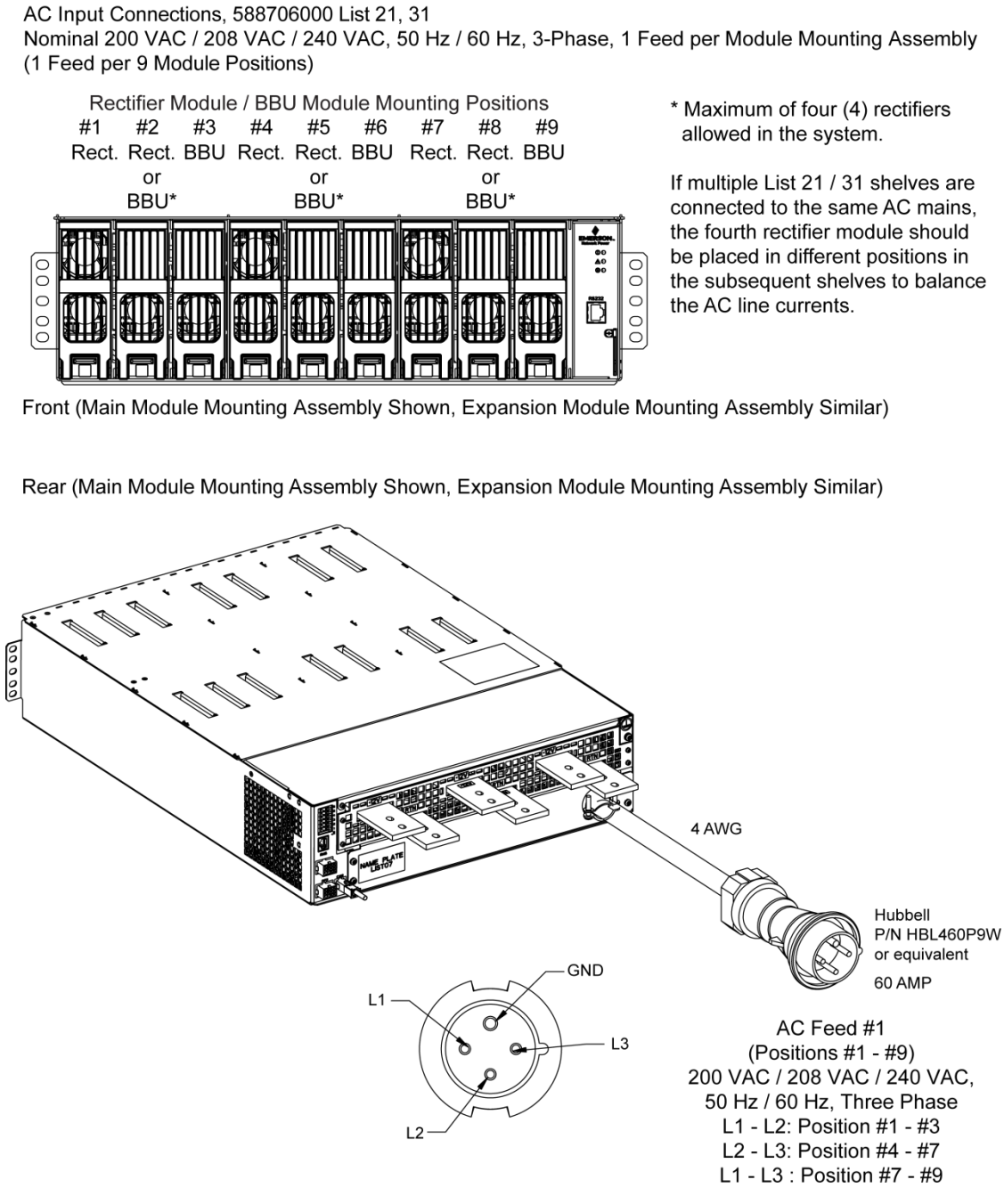
AC Feed #1
(Positions #1 - #9)
208 VAC / 240 VAC,
50 Hz / 60 Hz, Three Phase
L1 - L2: Position #1 - #3
L2 - L3: Position #4 - #7
L1 - L3 : Position #7 - #9

Connections to List 21, 31 Module Mounting Assembly

Spec. No. 588706000 List 21, 31 Module Mounting Assembly provides an AC input line cord and plug. Refer to Figure 16 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 16. DO NOT populate slots in any other arrangement than what is shown in Figure 16. Failure to follow this requirement could result in tripping of AC input protection devices.

Figure 16. AC Input Connections to a 588706000 List 21, 31 Module Mounting Assembly

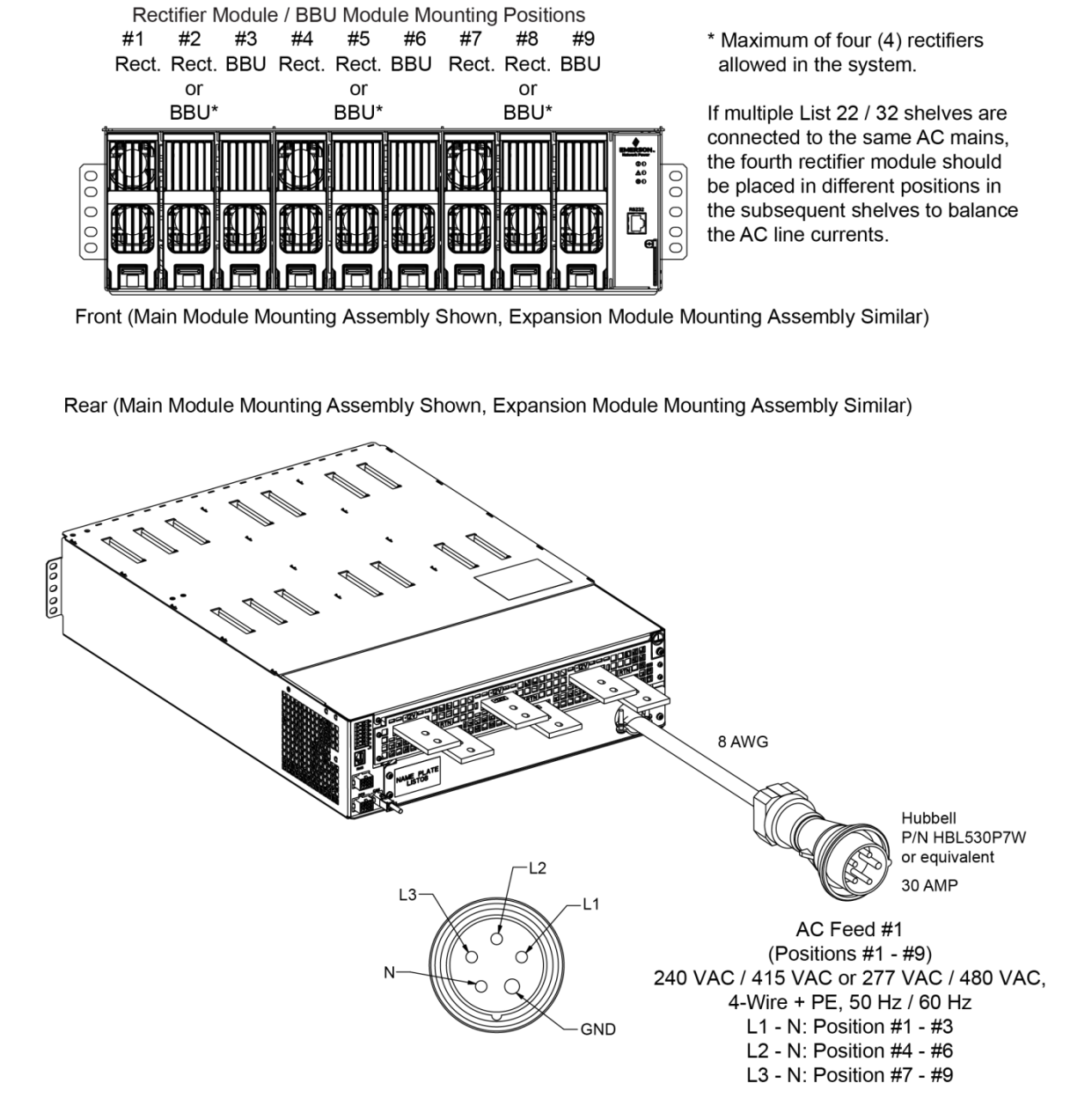


Connections to List 22, 32 Module Mounting Assembly

Spec. No. 588706000 List 22, 32 Module Mounting Assembly provides an AC input line cord and plug. Refer to Figure 17 for wiring details.

CAUTION! AC input sized for module mounting assembly population of rectifier and BBU modules as shown in Figure 17. DO NOT populate slots in any other arrangement than what is shown in Figure 17. Failure to follow this requirement could result in tripping of AC input protection devices.

Figure 17. AC Input Connections to a 588706000 List 22, 32 Module Mounting Assembly



Installing SCC Controller, Rectifier Modules, and BBU Modules

Note: *Install SCC controller, rectifier modules, and BBU modules as directed in the "Initially Starting the System" procedure starting on page 19.*

For SCC controller installation instructions, refer to SCC Controller Instructions (UM1M520HNA).

For rectifier module installation instructions, refer to rectifier module Instructions (UM1R123000).

For BBU module installation instructions, refer to BBU module Instructions (UM1B123000).

Initially Starting, Configuring, and Checking System Operation

Important Safety Instructions

CAUTION! Performing various steps in the following procedures may cause a service interruption and/or result in the extension of alarms. Notify any appropriate personnel before starting these procedures. Also, notify personnel when these procedures are completed.

Initial Startup Preparation

- Ensure that all blocks, except the last one, in the "Installation Acceptance Checklist" starting on page 2 have been checked.

Initially Starting the System

Procedure

1. Apply AC input power to the system by closing ALL external AC disconnects or protective devices that supply AC power to the module mounting assembly(s).
2. Insert rectifier modules and SCC controller into the module mounting assembly(s).
3. Insert BBU modules into the module mounting assembly(s).
4. Recommended to insert blank covers into empty slots.
5. The system is pre-configured. Refer to the master upstream supervisory and control unit (also known as the Rack Management System), such as the Avocent UMG, for system operation.
6. Observe the status of the indicators located on the SCC controller, rectifiers modules, and BBU modules. If the system is operating normally, only the green LED will be illuminated for the rectifier modules and the SCC. The BBU LED's will be as follows if the ambient temperature is below 22 °C. The red LED can be illuminated for up to 30 minutes due to an initialization period and the yellow LED should be illuminated during this period. The green LED will be slow blinking green after this period. Then after RAC is lifted above 0 %, only the green LED will be ON.
7. Verify all rectifier modules, BBU modules, and the SCC controller are fully seated, latched, and the latch handle screws secured.
8. Verify there are no external alarms and the local indicators are normal. See Table 1.

Table 1. Status and Alarm Indicators

Component	Indicator		Normal State
SCC Controller		Status (Green)	On
		Warning (Yellow)	Off
		Alarm (Red)	Off
Rectifier and BBU Modules		Power (Green)	On
		Protection/ Warning (Yellow)	Off
		Alarm (Red)	Off

Operating Procedures

SCC Controller, Rectifier Module, and BBU Module

For operation instructions on these units, refer to the following documents.

- SCC Controller Instructions (UM1M520HNA)
- Rectifier Module Instructions (UM1R123000)
- BBU Module Instructions (UM1B123000)

Use of the Rectifier Current Limit

In a system with both rectifiers and BBU's, you can set a current limit for the rectifiers in the system via the controller. When the load exceeds this current limit, the BBU's will provide power as needed.

Expected Number of Rectifiers and BBU's

You can set the number of rectifiers and BBU's expected to be in the system via the controller. If the controller does not find the specified number of rectifiers or BBU's, the controller will send an SNMP trap to notify the RMS.

Detailed Status for Rectifiers and BBU's

When a yellow or red LED is illuminated on a rectifier or BBU, the SNMP data from the controller can be used to identify the specific problem.

Local Indicators

SCC Controller, Rectifier Module, and BBU Module

Refer to the separate instruction documents for descriptions of the local indicators located on these units.

Maintenance

System Maintenance Procedures

It is recommended to perform the maintenance procedures listed in Table 2 every 6-months to ensure continual system operation.

Table 2. Maintenance Procedures to be Performed at 6-Month Intervals

PROCEDURE	REFERENCED IN
Check ventilation openings for obstructions such as dust, papers, manuals, etc.	--
Inspect and tighten all installer's connections	Making Electrical Connections section of this document.

BBU (Battery Backup Unit) Module

Refer to the BBU instructions (UM1B123000) for maintenance information.

BBU Storage Maintenance Charge

When the BBU is not plugged into a rack, there will be no external LEDs illuminated to conserve power. If BBU's are stored, they will periodically need a refreshing charge. Refer to the BBU Instructions (UM1B123000) for more information.

Troubleshooting and Repair

Contact Information

Support contact information is provided on the inside of the back cover of this document.

SCC Controller, Rectifier Module, and BBU Module

For troubleshooting and repair instructions on these units, refer to their separate instruction document.

- SCC Controller Instructions (UM1M520HNA)
- Rectifier Module Instructions (UM1R123000)
- BBU Module Instructions (UM1B123000)

System Troubleshooting Information

This system is designed for ease in troubleshooting and repair. The various indicators as described in the SCC Controller, Rectifier Module, and BBU Module Instructions are designed to isolate failure to a specific element. Once the faulty element has been identified, refer to "Replacement Information" on page 20 and "Replacement Procedures" on page 20.

Replacement Information

When a trouble symptom is localized to a faulty rectifier module, BBU module, or SCC controller; that particular device should be replaced in its entirety. No attempt should be made to troubleshoot or repair individual components on any rectifier module, BBU module, or controller.

Refer to SAG588706000 (System Application Guide) for replacement part numbers.

Replacement Procedures

DANGER! Adhere to the "Important Safety Instructions" presented at the front of this document.

Replacing an SCC Controller, Rectifier Module, or BBU Module

For replacement instructions on these units, refer to their separate instruction document.

- SCC Controller Instructions (UM1M520HNA)
- Rectifier Module Instructions (UM1R123000)
- BBU Module Instructions (UM1B123000)

Note: *BBU modules are expected to have a finite operational life, depending on discharge cycles and duration. The SCC controller provides a replacement alarm. Replace the BBU modules when the SCC controller activates a replacement alarm.*

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Phone	1.800.800.1280 option 1	

Customer Support Center (Post-Shipment)

Email	ESNACustomerSupportCenter@Emerson.com	After an order has shipped, contact our Customer Support Center with related questions, concerns or claims.
Phone	1.956.661.6867	

Account Management

Email	AccountManagement.ESNA@Emerson.com	Provides quotes and bid responses for custom configured [2] DC power systems and outside plant enclosures for customers and channel partners (Reps, VARs & Distributors).
Phone	1.800.800.1280 option 2	

Spare Parts

Email	DCpower.Spares@Emerson.com OSP.Spares@Emerson.com	Pricing and purchase orders for spare parts, including but not limited to breakers, cables, fuses, rectifier fans, misc. breaker and fuse panels, enclosure fans, doors and switches, etc.
Phone	1.800.800.1280 option 5	

DC Power Depot Repair

Email	DCpower.Repair@Emerson.com	Creates and processes RMAs for depot repair and refurbishment. Determines repair and refurbishment lead times and pricing based on warranties/contractual agreements. Provides repair shipping information and status.
Phone	1.800.800.1280 option 6	

Technical Support

Email	DCpower.TAC@Emerson.com OSP.TAC@Emerson.com	Answers technical product and system questions; determines status of warranties and contractual agreements for repair.
Phone	1.800.800.5260	

[1] Contact Account Management for custom-configurations.
[2] Contact DC Power Spare Parts for parts and accessories.

For More Information

To learn more about service offerings from Emerson Network Power, please contact your sales representative, call 1-800-800-1280 option 7, email ES.Services@Emerson.com or visit EmersonNetworkPower.com/EnergySystems.

NetSure™ +12 VDC Bulk Output Power System

Installation and User Manual, UM588706000

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Model No: PSS12/2000-19BC, PSS12/2000-19B

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