vesta online

PM/BE

Power Module/Battery Enclosure

*Vesta PM Power Module shown stacked on one BE Battery Enclosure Module

Installation Guide

VO 1500, VO 2000S, VO 2400, VO3600, VO 4000S, and VO 5000S Series

XANTREX
Smart Choice For Power

Vesta Power Module/Battery Enclosure

Table of Contents

Disclaimer of Liability

Since the use of this manual and the conditions or methods of installation, operation, use and maintenance of the unit are beyond the control of Xantrex Technology Inc., the company does not assume responsibility and expressly disclaims liability for loss, damage or expense arising out of or any way connected with such installation, operation, use or maintenance.

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This guide contains important safety instructions that should be followed during the installation and maintenance of this product.

To reduce the risk of electrical shock, and to ensure the safe installation and operation of this product, the following safety symbols have been placed throughout this manual to indicate dangerous conditions and important safety instructions.

WARNING - A dangerous voltage or condition exists in this area.
Use extreme caution when performing these tasks.

AVERTISSEMENT - Une tension ou condition dangereuse existe dans cette zone.
Faire preuve d'extrême prudence lors de la réalisation de ces tâches.

CAUTION - This procedure is critical to the safe installation or operation of the unit. Follow these instructions closely.

ATTENTION - Cette procédure est essentielle à l'installation ou l'utilisation de l'unité en toute sécurité. Suivre ces instructions de près.

NOTE - This statement is important. Follow instructions closely.

NOTE - Cette déclaration est importante. Suivre les instructions de près.

- Turn OFF all power supplied to this equipment before working on or inside equipment.
- All electrical work must be done in accordance with local and national and electrical codes.
- Before installing or using this device, read all instructions and cautionary markings located in (or on) the manual, the PDC, Power Module, etc.
- Do not expose this unit to rain, snow or liquids of any type. This product is designed for dry indoor locations only (contact Xantrex for outdoor rated models).
- To reduce the chance of short-circuits when installing renewable energy systems, use insulated tools.
- Remove all jewelry such as rings, bracelets, necklaces, etc., prior to installing this system. This will greatly reduce the chance of accidental exposure to live circuits.
- The renewable power systems may contain more than one live circuit (batteries and AC line). Power may be present at more than one source.
- This product contains no user serviceable parts. Contact an authorized Xantrex Service facility for any repairs.
- Vesta Online power modules provide 120/240 VAC output suitable for connection to multi-branch circuit wiring. Stand-alone inverters *usually* supply only 120 VAC output which could pose a fire hazard due to an overloaded neutral return wire in this configuration.
- The PDC is intended to be installed by a *licensed electrician*, or *technician* familiar with the electrical code requirements and accepted wiring techniques. Consult local authorities as to national and/or local electrical codes and any additional installation requirements. It is the *installer's* responsibility to ensure this product is installed in compliance with the NEC/CEC and local applicable electrical codes.

BATTERY SAFETY INFORMATION

- Always wear eye protection, such as safety glasses, when working with batteries.
- Remove all loose jewelry before working with batteries.
- Never work alone. Have someone assist you with the installation or be close enough to come to your aid when working with batteries.
- Always use proper lifting techniques when handling batteries.
- Always use identical types of batteries when parallel or series connecting multiple batteries.
- Never install old or untested batteries. Check each battery's date code or label to ensure age and type.
- Batteries are temperature sensitive. For optimum performance, they should be installed in a stable temperature environment or charged with a temperature compensation battery charger.
- When installing batteries, allow at least 1 inch of air space between batteries to promote cooling and ventilation.
- NEVER smoke in the vicinity of a battery or generator.
- Always connect the cables to the Power Module first, then connect the cables to the batteries with the DC disconnect device switched OFF. This will greatly reduce the chance of spark in the vicinity of the batteries.
- Use insulated tools when working with batteries.
- When connecting batteries, always verify proper voltage and polarity.
- **Do not short-circuit battery cables. Fire or explosion can occur.**
- In the event of exposure to battery electrolyte, wash the area with soap and water. If acid enters the eyes, flood them with running cold water for at least 15 minutes and get immediate medical attention.
- Always recycle old batteries. Contact your local recycling center for proper disposal information.

1.0 INTRODUCTION

Thank you for purchasing the Vesta Power Module (PM) from Xantrex Technology Inc. The Vesta Series is one of the finest electrical backup power systems on the market today, incorporating state-of-the-art technology to ensure critical loads remain powered during utility outages.

The Vesta Power Module (PM) converts DC battery power into AC backup power to operate common household appliances and loads such as television and radio receivers, computers, lights, etc., when utility power fails. The Vesta PM is a complete backup system which includes the inverter/charger, DC disconnect, AC input and output breakers providing NEC/CEC compliant installation.

The Vesta backup system is expandable, operating time may be extended by increasing the size of the battery bank. The Power Modules are designed to stack on top of one or two BE Battery Enclosure modules which accommodate the sealed storage batteries. Additional BE enclosures may be added by stacking another set of BE enclosures to the side (left or right) of the main Power Module stack for increased run time. Battery cables from the additional BE enclosures can be run in a conduit to the main Power Module.

The flexibility of the Vesta Series allows the addition of solar panel/charge controller, wind generator or micro-hydro systems to the system, providing a complete “renewable energy system” to power off-grid homes where utility power is not available.

The Power Module keeps the batteries fully charged (using the utility grid) and provides the backup AC power during utility outages, to the critical loads. The PM/BE stack may be used without the Power Distribution Center (PDC) as a basic backup system (providing backup to two 15–25 amp circuits directly) or with the PDC, which distributes the AC power (1500–5500 watts depending on model) through up to 8 branch load circuits. In addition, the PDC adds 60 amps automatic transfer capacity, generator manual transfer, generator inlet receptacle and manual load shedding for inverter or generator load management. The PDC-GT generator interface provides prolonged backup power by periodic or daily battery recharging from a portable 120/240 VAC 20 amp generator.

Figure 1-1
Vesta Power Module (PM) and Battery Enclosure (BE)

1.0 INTRODUCTION

Unpacking and Inspection

- Carefully unpack the Power Module (PM) from its shipping carton(s).
- The Power Module should contain the Power Module enclosure, including inverter, AC/DC breakers, display, Vesta installation guide/inverter operator's manual, battery cables and hardware (only if mounting two or more enclosures together). BE enclosures and batteries are sold separately.
- Verify all of the items listed on the packing material sheet are present. Please call Xantrex Customer Service at (360) 435-8826 if any items are missing.
- Contact the carrier immediately if the shipping box or unit is damaged.
- Units damaged in shipping can only be returned to Xantrex after an inspection and claim is filed with the carrier and a return authorization number is obtained from Xantrex.

NOTE: Due to continual improvement through product updates, photographs and/or illustrations used in this guide may not *exactly* match your unit. Xantrex Technology Inc. reserves the right to update this product without notice or releasing an updated manual when *fit, form or function* are not affected.

Pre-Installation

Determine the Load Circuits to Backup

The Vesta Power Modules provide a 2-pole, 15–25 amp (model dependant), 120/240 VAC OUT breaker allowing two 15–25 amp, 120/240 VAC load circuits to be backed up. The maximum load (watts) that can be backed up, is determined by the maximum output capacity of the inverter and the run time (backup time) is determined by the battery bank size (in amp-hours or watt-hours).

Appliances that may require backup include: refrigerators, furnace, microwave, home office equipment, lighting, entertainment equipment, water pumps, etc.

Electric heaters including electric hot water heaters, stoves, air-conditioners, etc. are not recommended due to their high power consumption, which would quickly deplete battery power or overload the inverter.

When operating loads directly from the Vesta Power Module the power is distributed via two 15–25 amp circuit breakers. The inrush current for certain loads (including motors, compressors, etc.) must be considered when connecting to these 15 amp circuits so the Vesta module is not overloaded.

NOTE: Local/national electrical codes may specify a separate dedicated circuit for running a furnace or refrigerator/freezer, etc.

The Vesta Power Module is designed to operate with the Power Distribution Center (PDC) to provide maximum benefit from the backup power system. The PDC provides eight, automatically transferred load circuits, which are hardwired into the buildings wiring during construction or retrofit. The PDC also provides manual load shedding control, where noncritical loads can be switched OFF, allowing only the most critical loads to operate, thus extending backup run times. A portable generator can be connected to extend run time (by recharging the batteries) or to power heavier loads through the PDC generator panel's three AUXILIARY UTIL/GEN ONLY load circuit breakers. The PDC can also be equipped with a system monitor containing a readout of "% of Backup Power Remaining" or "Battery Capacity."

Location

- Locate the Vesta Power Module in a cool, clean, dry environment where the ambient temperature will be maintained between 59–77 °F (15–25 °C) such as a temperature controlled garage or basement. Unheated locations are not recommended since the temperature may drop below freezing, dramatically reducing backup time due to degraded battery capacity. Hot locations, > 77 °F (25 °C), are not recommended as this reduces battery life.

- Allow at least 8 inches (20 cm) of space around the sides and top of the Vesta enclosure for proper ventilation, and conduit/cable access. The Power Module is designed to be stacked/ mounted on top of one or two Vesta BE Battery Enclosures (depending on the run-time required). Each module has a height of 24 inches (61 cm). The maximum height of three stacked units is 72 inches (182 cm). The lid of the Power Module is removable for service access. Leave enough overhead room to accommodate removal of the lid.

- The mounting/support wall must be vertical and the floor must be level and square to the wall. If these requirements are not met, a suitable rigid supporting structure must be supplied by the installer. The Vesta module stack MUST be anchored to the wall and is NOT designed to be a free standing device.

- The floor must be able to support the weight of the Vesta unit. This could be up to 1300 lb (590 kg) for a three module stack with maximum battery density. A level concrete basement or garage floor is ideal.

NOTE: A loading pad and supporting structure may need to be installed to ensure structural support if mounting on a wood floor as most floors are only designed to carry 40-50 lb per square foot according to building codes.

2.0 INSTALLATION

Configuration

The Vesta Power Module and Battery Enclosure modules can be installed in various configurations to best suit the available floor space (ceiling height) and future expansion options.

Do not stack the Vesta power system more than *three* units high (two Battery Enclosures and one Power Module). The Power Module (containing the electronic inverter/charger) must be situated so it is the *TOP* module.

All modules *must* be securely fastened to the wall using wood screws as described in the installation text. Side situated modules must be positioned so the mounting holes will align with the wall studs.

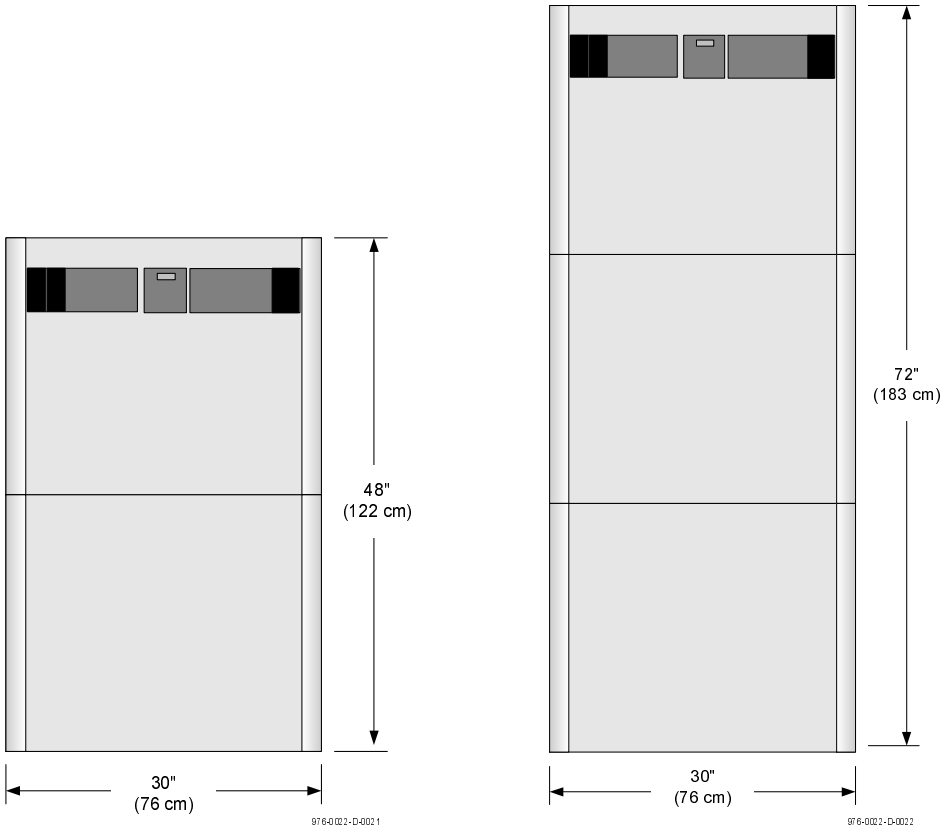
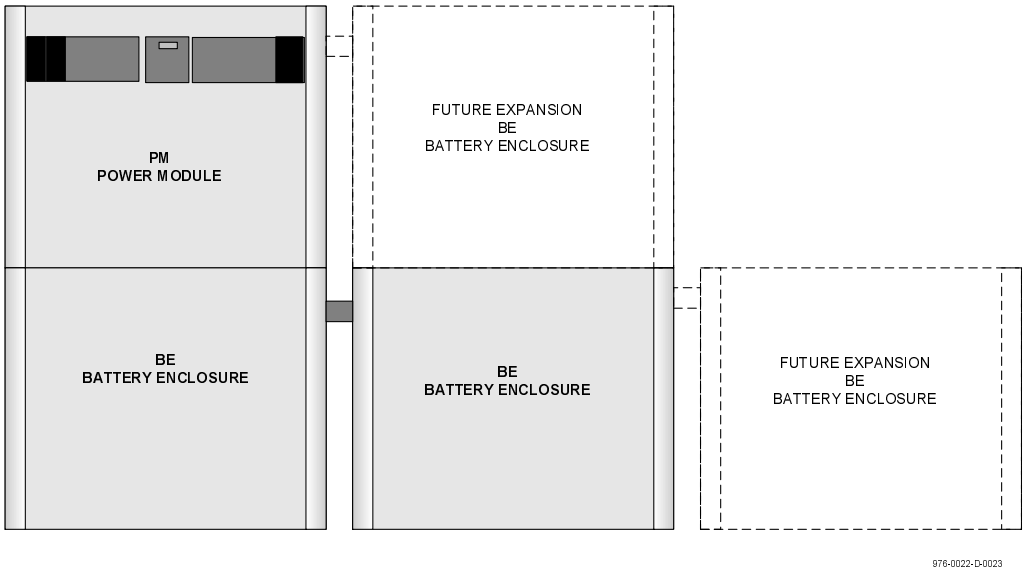


Figure 2-1
Vesta Power System (two and three stack arrangement)



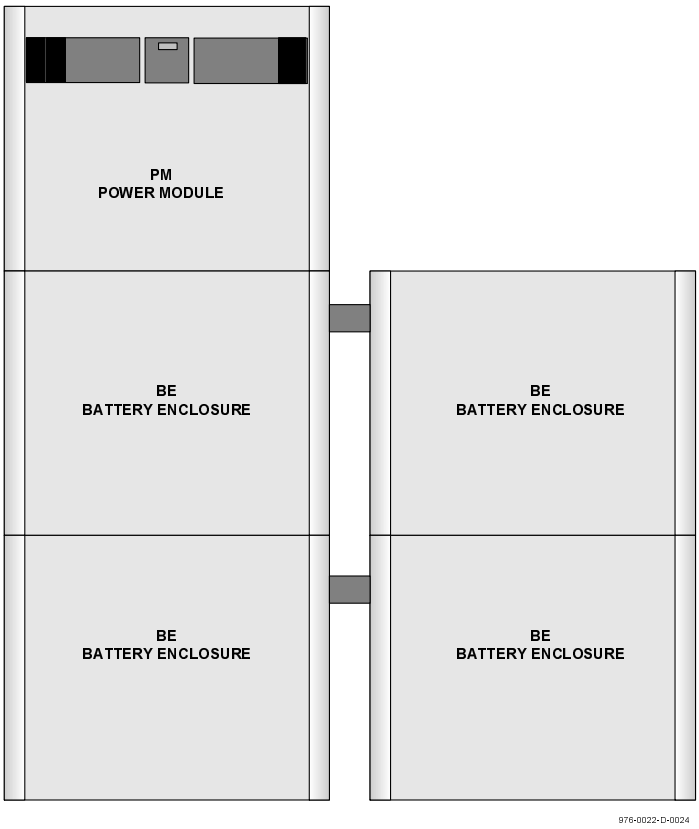


Figure 2-2
Side Stacking for Additional Battery Capacity

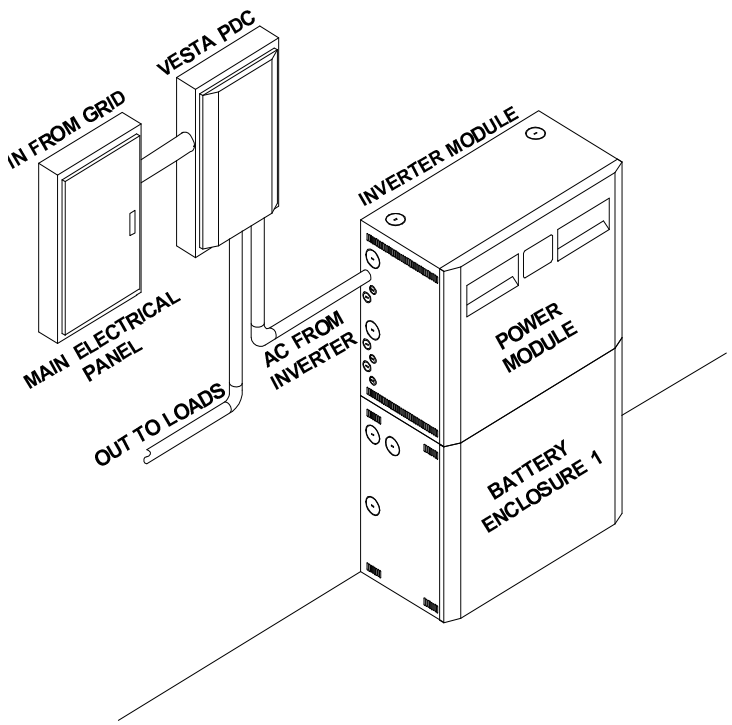


Figure 2-3
Vesta Power System Using the PDC (typical two stack system)

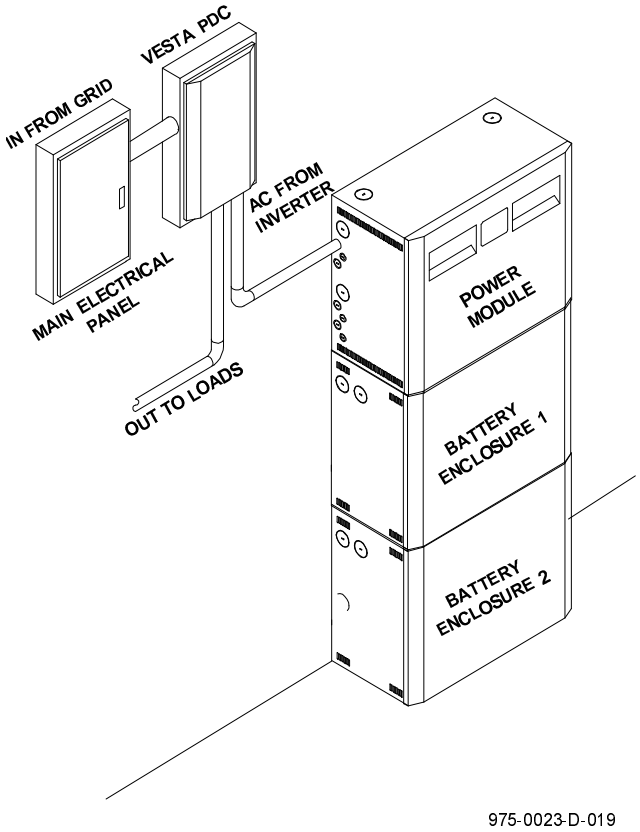


Figure 2-4
Vesta Power System Using the PDC (typical three stack system)

Mounting

WARNING: TO PREVENT POSSIBLE INJURY, HAVE ANOTHER PERSON ASSIST WITH LIFTING OR MOVING THE ENCLOSURES OR BATTERIES.

1. Position the Vesta Battery Enclosure against the wall where it will be installed. A floor loading pad may be required. Remove the front cover from the Vesta Battery Enclosure (BE) by loosening the two screws near the top of the front panel. Lift up slightly and remove the panel.

2. Ensure the pass-through hole (2.5 inch diameter) has the conduit/cable bushing installed to protect the battery cabling (installed later). Refer to Figure 2-6.

NOTE: The removable shelf in the BE enclosure normally holds one 4D/12-200 sealed battery and the lower compartment holds a second battery. If taller 2 volt batteries are used, removal of the shelf may be required. If the shelf is to be used, ensure it is secured in place via the internal tabs.

3. Secure the BE to the wall *studs* (or 3/4 inch plywood backing secured to the wall studs) using at least two (one left, one right) 1/4 inch x 1-1/2 inch lag bolts through the holes in the enclosure's back panel.

4. If only *one* BE module is being installed, skip to Step 10.

5. Unpack the second BE module. Remove the front cover by loosening the two screws at the top of the panel and lifting slightly to remove it. Ensure the battery shelf is securely in place (if needed) and the shelf pass-through hole bushing is in place to protect the battery cables (installed later).

6. Place the Vesta BE module on top of the first module installed. The back panel must be flush against the mounting wall and be aligned vertically with each other.

7. Install the 2 inch conduit knockout bushings into the aligned 2.5 inch holes. The bushing must pass through the knockout holes of both BE enclosures. Refer to Figure 2-6.

8. Secure the upper BE enclosure to the wall studs using at least two (one left, one right) 1/4 inch lag bolts and washers or #14 x 1-1/2 inch (minimum length) screws.

9. Unpack the Vesta Power Module (PM) and remove the front cover by loosening the two screws on the top of the front panel. Lift up slightly to remove the panel.

WARNING: THE POWER MODULE (PM) CONTAINS THE PRE-INSTALLED INVERTER/ CHARGER AND CAN BE EXTREMELY HEAVY. ENSURE ADDITIONAL HELP IS AVAILABLE TO LIFT AND INSTALL THE POWER MODULE.

10. Lift the PM module and place it on top of the BE enclosure(s) stack. The back panel should be flush against the wall.

11. Install a 2 inch conduit knockout bushing into the aligned 2.5 inch knockout holes. The bushing must pass through the knockout holes of both the PM and BE enclosures. Refer to Figure 2-6.

12. Secure the upper BE enclosure to the wall studs using at least two (one left, one right) 1/4 inch lag bolts and washers or #14 x 1-1/2 inch (minimum length) screws.

Mounting (continued)

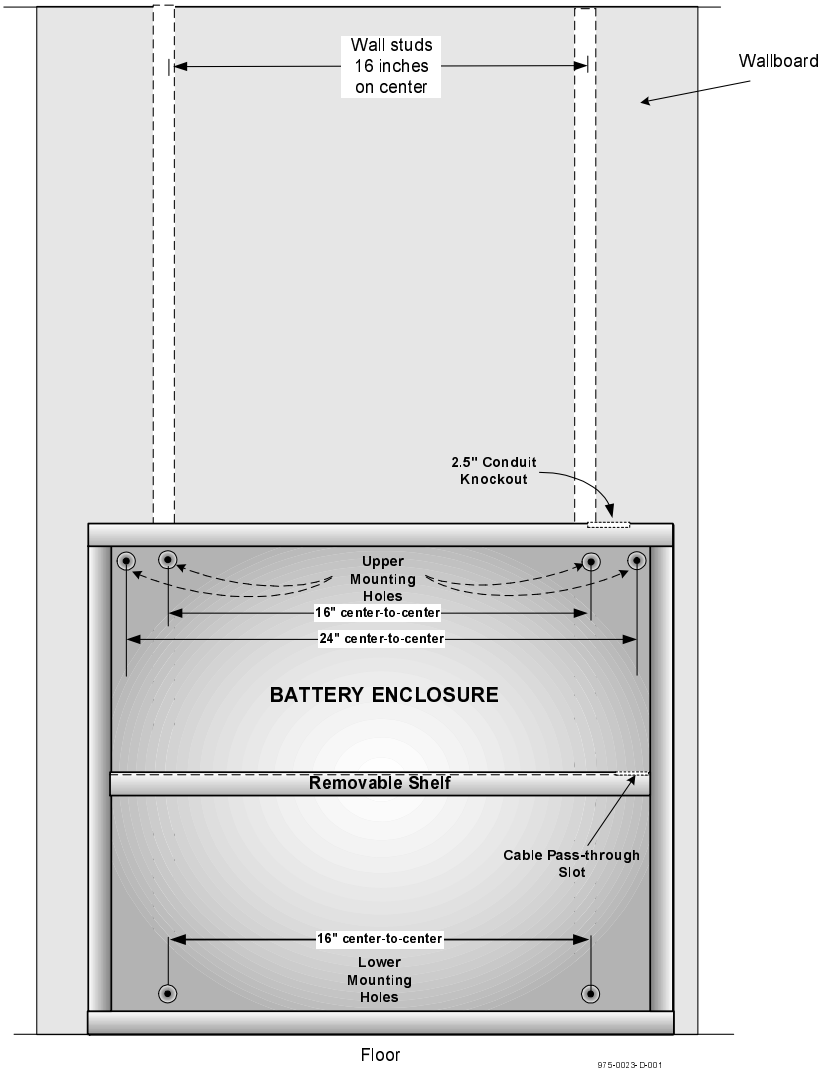


Figure 2-5
Secure Single Battery Enclosure to Wall Studs

Mounting (continued)

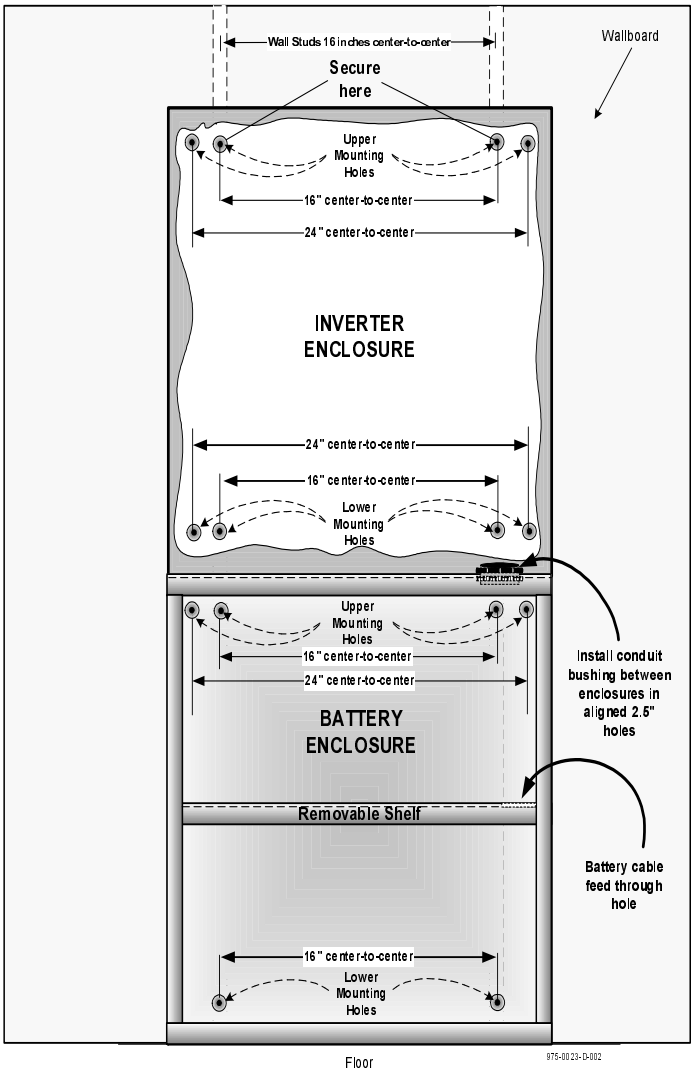


Figure 2-6
Secure Stacked Power Module to Wall Studs

Mounting (continued)

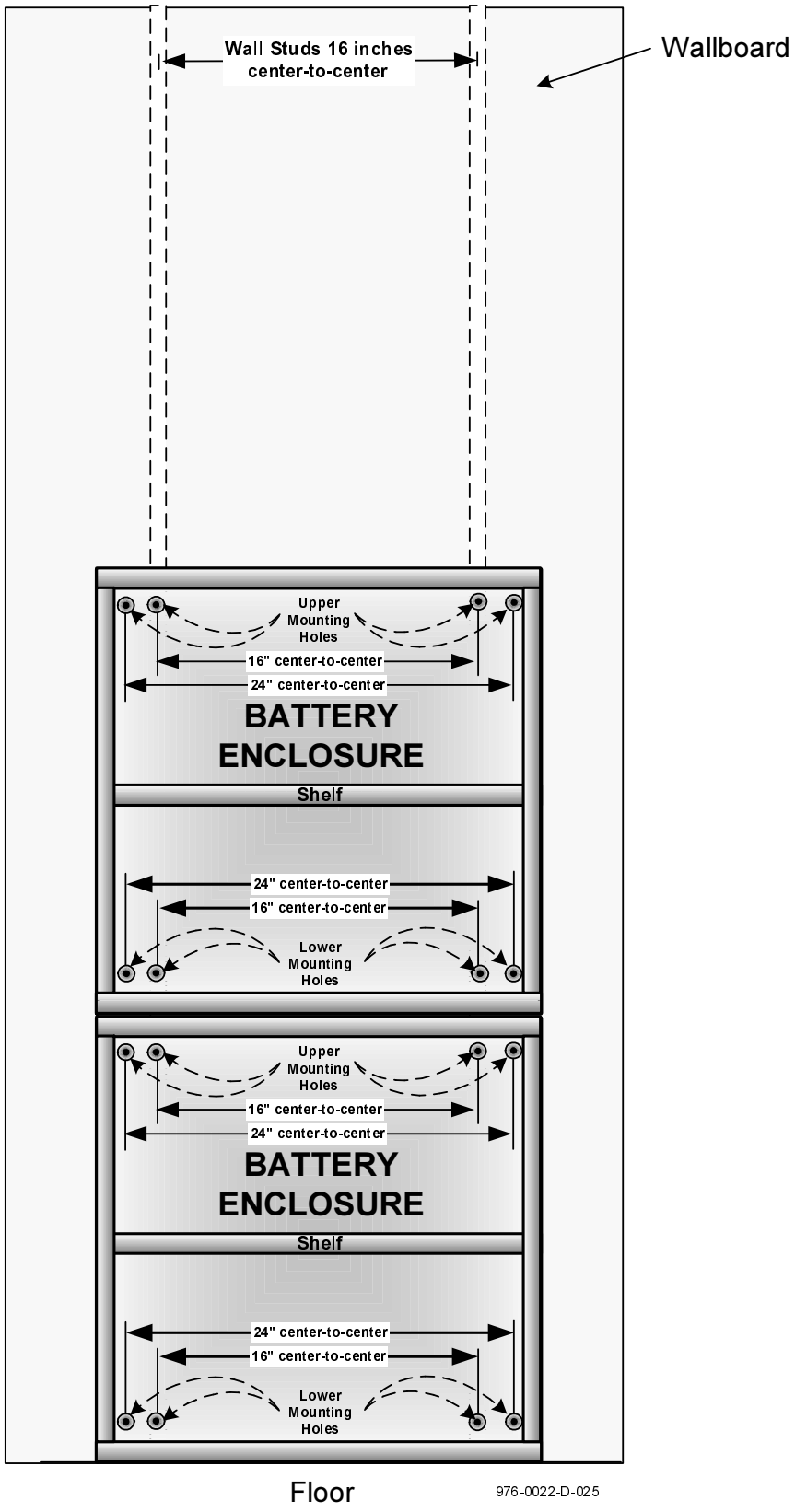


Figure 2-7
Secure Stacked Battery Enclosures to Wall Studs

Mounting (continued)

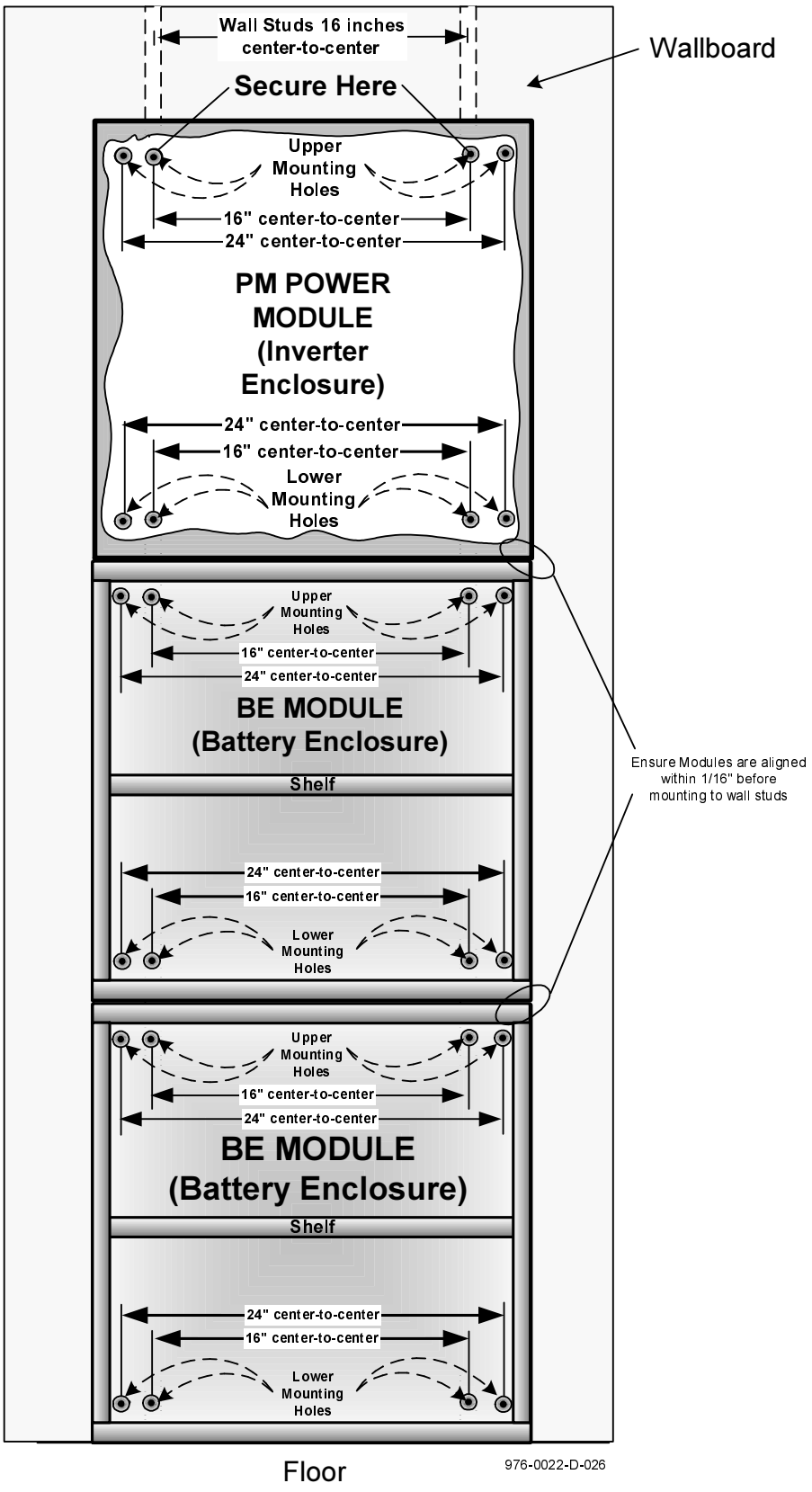


Figure 2-8
Dual Battery Modules and Power Module Secured to Wall Studs

AC Input/Output Connections

The Vesta Power Module is designed to be used in conjunction with the Power Distribution Panel (PDC) for maximum functionality. If you are installing the PDC refer to the PDC installation guide for connection to the Vesta Power Module's AC INPUT/ OUTPUT terminals. Alternatively, the Vesta Power Module may be used without the PDC for basic installations requiring only two backup load circuits and no generator transfer capability. The following steps describe a basic installation WITHOUT a PDC unless otherwise noted.

WARNING: ENSURE THE MAIN INLET CIRCUIT BREAKER IS *OFF* BEFORE PERFORMING ANY REWIRING IN THE MAIN SERVICE DISCONNECT OR PDC ENCLOSURE. USE EXTREME CAUTION WHEN WORKING IN THE MAIN PANEL. WIRING SHOULD BE PERFORMED BY A QUALIFIED TECHNICIAN OR LICENSED ELECTRICIAN ONLY.

1. Switch the main electrical breaker OFF, and remove the electrical panel cover. Locate or install a (120 VAC/30 amp) single pole breaker (120 VAC/60 amp breaker for VO 4000S and VO 5500S models) in the main electrical panel. This breaker will be used to supply power to the Vesta backup power system.

NOTE: If a PDC is installed, this breaker may be located in the PDC generator transfer panel (if the GT option is installed).

2. Install a #10/2 AWG (or #6/2 for wire VO 4000S and VO 5500S models) wire (Hot, Neutral, plus Ground), from the main electrical panel feed breaker to the Vesta Power Module. Depending on location, shielded wire or conduit may be needed according to NEC/CEC requirements and your electrical inspector. Standard conduit connector knock outs are provided on the Vesta side and rear panels.

3. Connect the ground wire from the electrical panel to the GROUND BUS in the Power Module. Refer to Figure 2-9.

4. Connect the neutral wire from the electrical panel to the NEUTRAL BUS in the Power Module. Refer to Figure 2-9.

5. Connect the HOT wire from the main electrical panel to the *lower* terminal of the AC IN breaker. Refer to Figure 2-9.

3. The Vesta Power Module provides a 2-pole, 25 amp, 120/240 VAC output breaker which allows you to backup two 120/240 VAC load circuits. These two backed up load circuits should be selected to provide power to the most important loads within the 15–25 amp Vesta Power Module breaker capacity. Refer to Figure 2-10.

4. Locate the 2-pole, 120/240 VAC, 25 amp, "AC Out" breaker on the Vesta Power Module. Connect the selected two load circuit wires to the AC output breakers using #10/3 AWG (Hot 1, Hot 2, Neutral, plus Ground). Refer to Figure 2-10.

NOTE: If a PDC is installed, the Vesta AC OUT breakers are connected to the Inverter INPUT terminals in the PDC.

5. The Vesta PM front cover is reinstalled **after** the inverter is setup below.

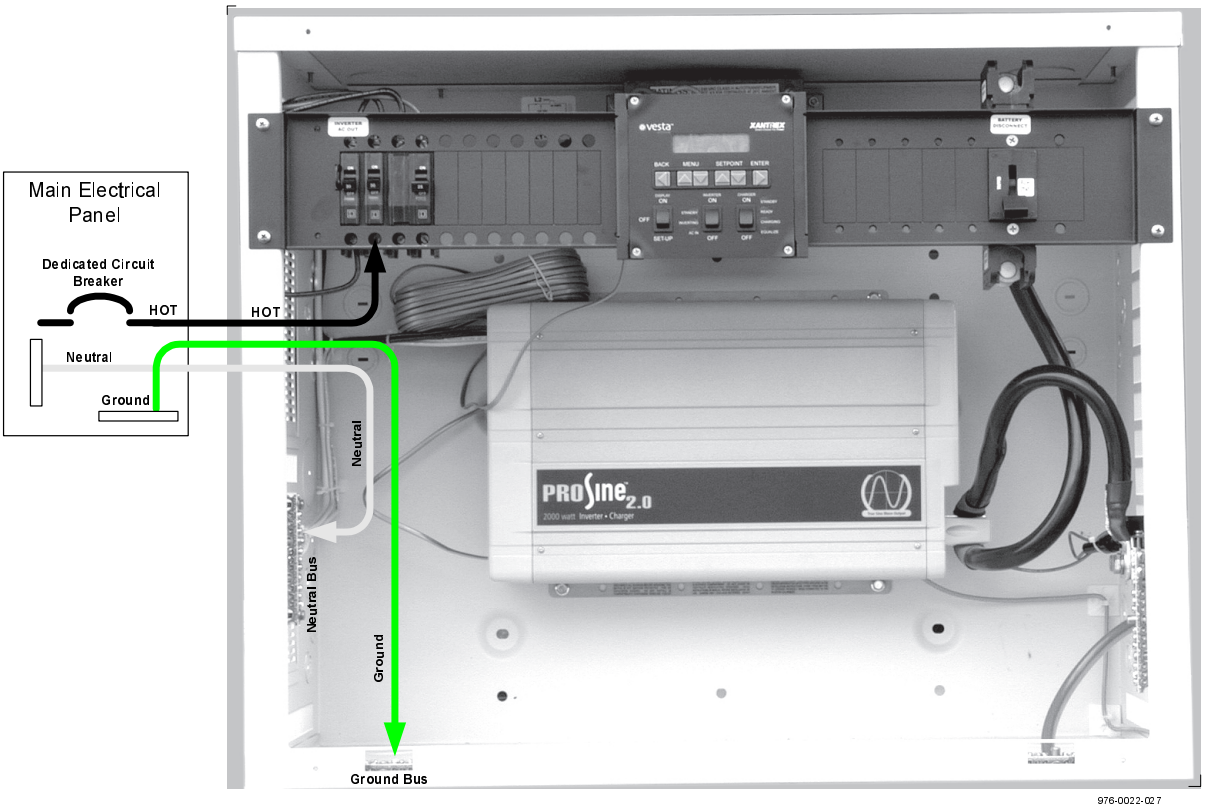


Figure 2-9
AC Input Wiring

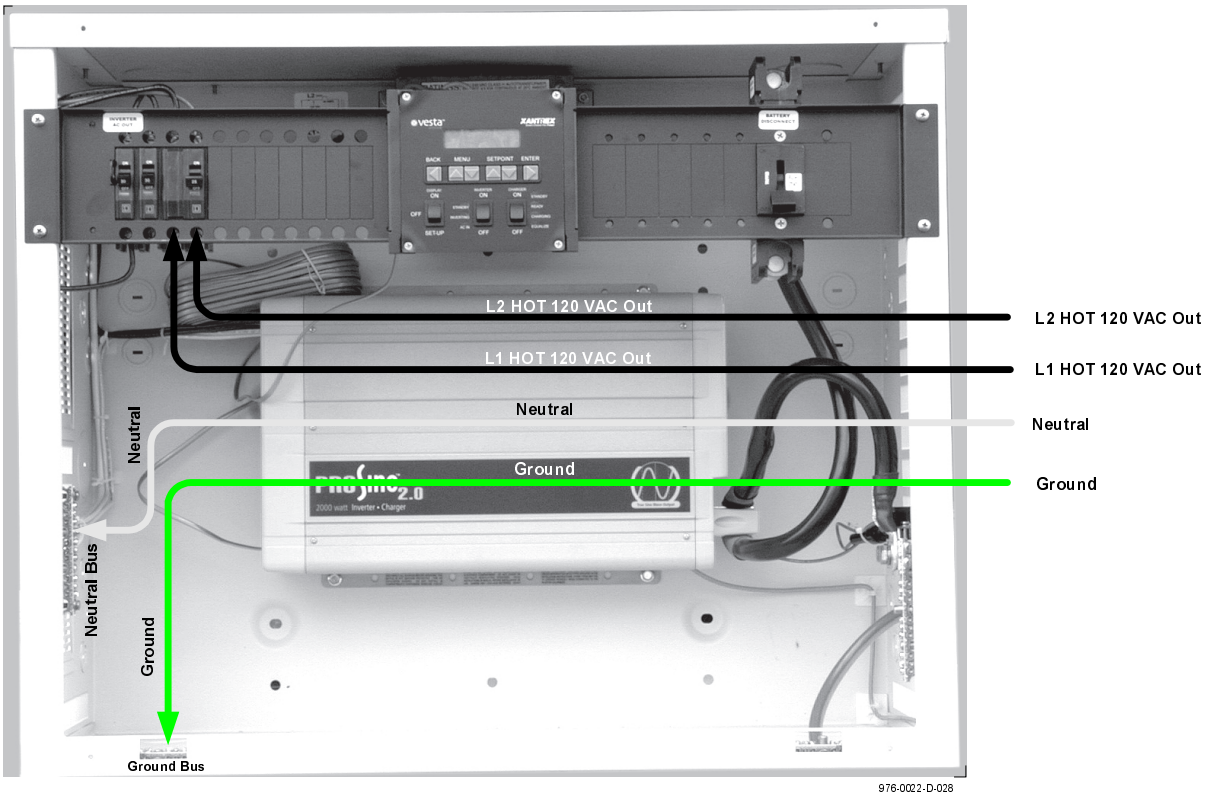


Figure 2-10
AC Output Wiring

2.0 INSTALLATION

DC Battery Configuration and Installation

The battery configurations for the Vesta Series vary according to the model type.

CAUTION: THE *BATTERY VOLTAGE* MUST MATCH THE *SYSTEM VOLTAGE* OR DAMAGE TO THE BATTERIES AND/OR INVERTER WILL OCCUR. THIS TYPE OF DAMAGE IS NOT COVERED BY THE WARRANTY.

WARNING: OVERCHARGING BATTERIES DUE TO IMPROPER BATTERY VOLTAGE FOR THE INVERTER (i.e., 24 volts charging of a 12 volt battery) MAY CAUSE BATTERIES TO OVERHEAT OR EXPLODE CAUSING PERSONAL INJURY AND PROPERTY DAMAGE. ALWAYS VERIFY BATTERY VOLTAGE *BEFORE* CONNECTING IT TO THE INVERTER.

- Vesta Online 1500, 2400, 3600 and 4000S with *24 VDC* systems, refer to 24 VDC Installations.
- Vesta Online 2000's with *12 VDC* systems, refer to 12 VDC Installations.
- Vesta Online 5500S with *48 VDC* systems, refer to 48 VDC Installations.

CAUTION: THE VESTA PM/BE STACKED MODULE SYSTEMS ARE *NOT* DESIGNED FOR FLOODED BATTERIES (LIQUID LEAD ACID). FLOODED BATTERIES MUST NOT BE USED IN THE VESTA ENCLOSURES. IF FLOODED TYPE BATTERIES ARE USED TO POWER THE SYSTEM, THEY MUST BE LOCATED IN A SEPARATE AREA (AWAY FROM THE POWER MODULE) WHERE ADEQUATE VENTILATION PROVIDED.

UL Recognized Batteries

NOTE: Xantrex recommends using quality UL recognized *SEALED, VALVE-REGULATED LEAD ACID* batteries.

NOTE: Use only UL recognized system component batteries in home backup installations.

The following batteries are suitable to be used in Vesta backup power systems and are recognized by UL as safe for backup power systems. Contact your Vesta dealer for details regarding batteries, availability and pricing.

Other UL recognized batteries:

*Concorde Chairman™

AGM-12100T,

AGM-12105T,

AGM-12210L,

AGM-12255L,

AGM-6100L or

AGM-6220U

NOTE: The installation section of this manual refers to a typical 12 volt, 200 amp-hour battery for constructing the battery bank. Other, smaller capacity, lighter weight batteries may be used, provided they are UL recognized VRLA type and fit the BE enclosure and termination requirements.

*NOTE: Xantrex does not supply or warranty batteries other than the Xantrex brand XS Series batteries. If using other branded batteries, refer to the manufacturer's literature for charge/discharge specifications. Xantrex makes no claim as to the suitability of these batteries in a Vesta system.

Battery Temperature Sensor Installation

Installations where the batteries are installed in a separate enclosure, require the battery temperature to be monitored while charging. This assures the proper charge rate to the batteries preventing under or overcharging. The Vesta PM/BE is supplied with a Battery Temperature Sensor (BTS) which is placed on the side of one of the batteries (some BTS's also allow for connection to a battery terminal).

NOTE: The BTS should be routed to the battery compartment BEFORE routing the battery cables.

Procedure

1. Locate the BTS packed with the Power Module.
2. Route the BTS through the cable feed-through holes in the bottom of the enclosure to one of the battery shelves in the BE module.
3. Remove the paper backing from the module and attach it to the side of one of the batteries (it does not matter which one it is attached to).
4. Coil up any excess wire and move it out of the way. Secure the coil of wire with tape or a cable tie.

NOTE: Ensure the plug side of the BTS cable is installed in the inverter's BTS jack. Refer to the inverter manual for location if it is not.

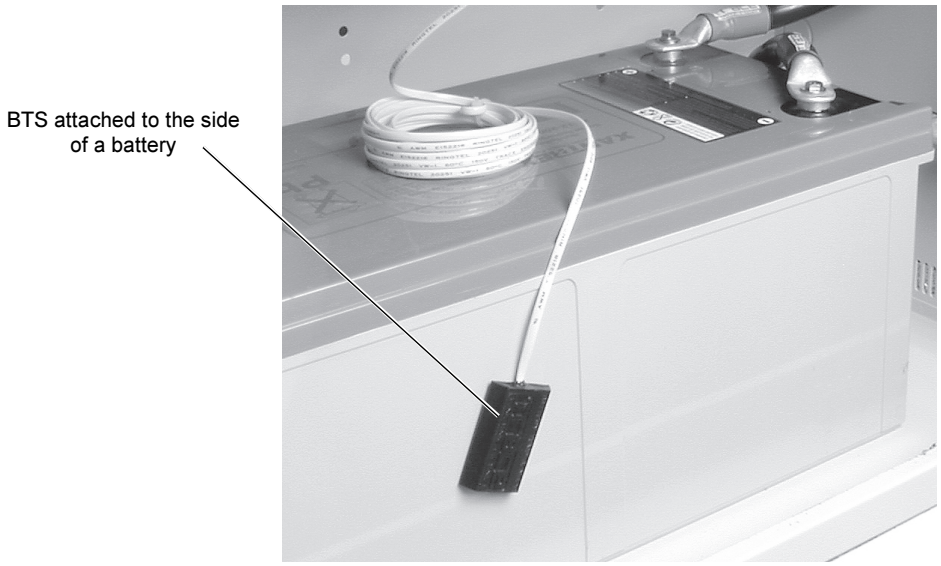


Figure 2-11
BTS Attached to Battery

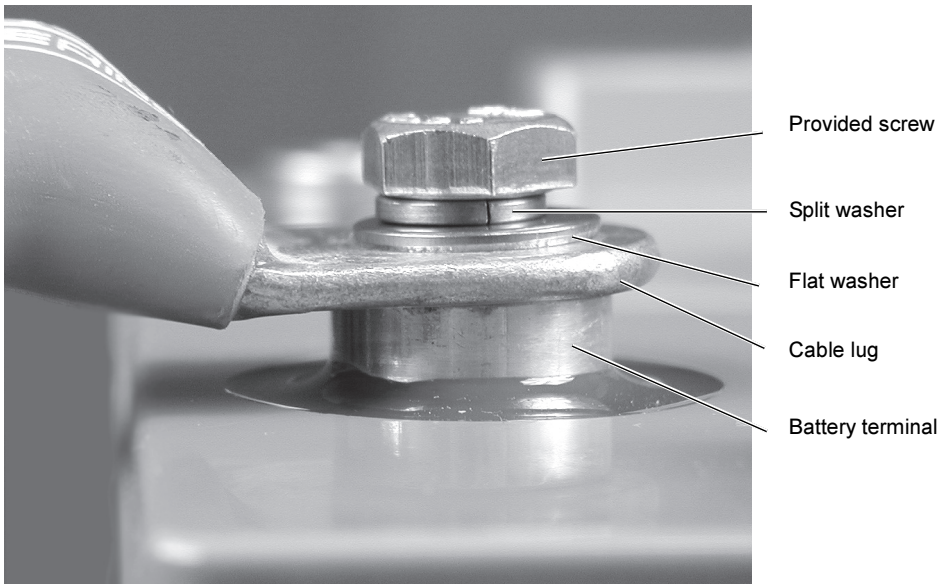


Figure 2-12
Threaded Insert Terminal Battery Connections

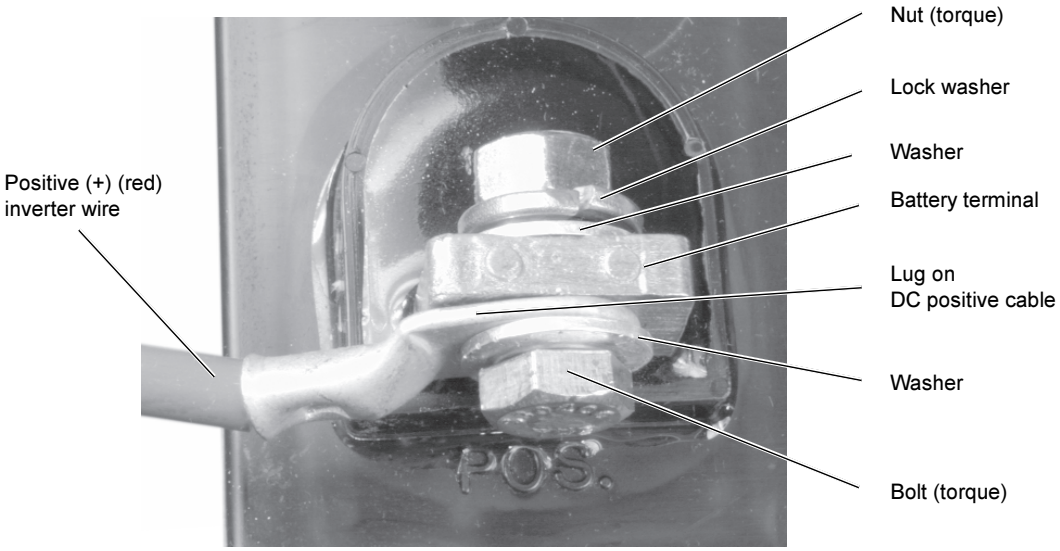


Figure 2-13
Non-threaded "L" Terminal Battery Connections

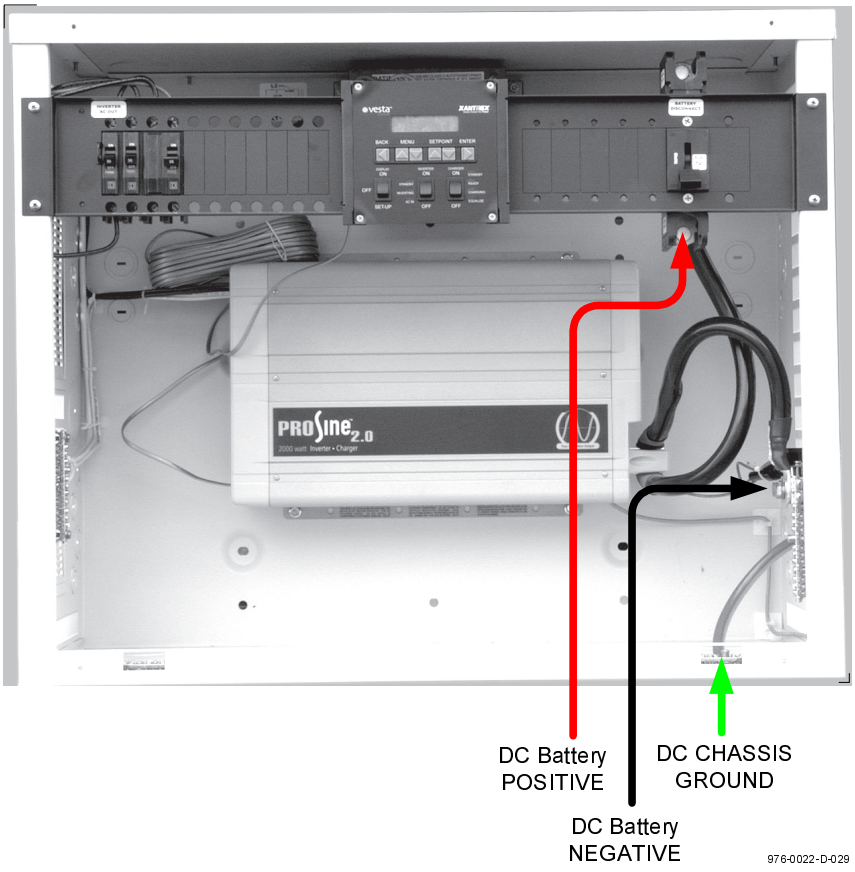


Figure 2-14
DC Battery and Ground Connections

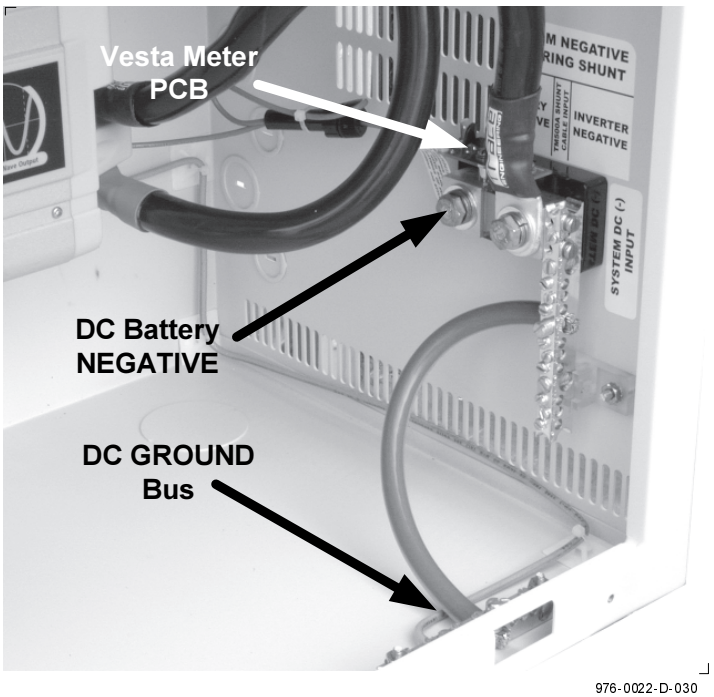


Figure 2-15
Close-up of DC Section

24 VDC Systems

24 VDC battery banks are typically wired using two, 12 VDC batteries in a series configuration. Additional 24 VDC banks can be added in parallel to increase run time (using two BE Battery Enclosures).

NOTE: Other arrangements using 2 or 6 volt batteries (to achieve 24 volts) are possible. Consult a Xantrex Dealer or installer for wiring details.

WARNING: DO NOT SHORT CIRCUIT THE BATTERY TERMINALS. FIRE OR EXPLOSION MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING: BATTERIES ARE EXTREMELY HEAVY. ALWAYS USE PROPER LIFTING TECHNIQUES AND HAVE HELP AVAILABLE WHEN INSTALLING BATTERIES INTO THE ENCLOSURES.

1. Ensure the Vesta DC disconnect is switched OFF.

2. Route the two DC cables from the Vesta Power Module enclosure through the 2 inch conduit bushing located on the bottom, right-hand side of the enclosure. The negative cable is longer and should be routed through the cable slot located on the right-hand side of the BE enclosure to the lower shelf.

WARNING: ENSURE THE CABLE ENDS DO NOT TOUCH THE BATTERY TERMINALS OR ANY METAL PART OF THE ENCLOSURE.

WARNING: ENSURE THE BATTERY TERMINALS DO NOT SHORT TO ANY METAL PARTS OF THE ENCLOSURE.

3. Unpack two 12 volt 200 Ah batteries. Place the batteries in the Vesta BE enclosure with the terminals located on the right-hand side.

4. Locate the series battery interconnect cable and route it through the battery cable slot in the BE shelf.

5. Connect the lower battery's POSITIVE terminal to the upper battery's NEGATIVE terminal using the battery interconnect cable. See Figure 2-16.

CAUTION: DO NOT OVERTIGHTEN THE BATTERY BOLTS. TERMINAL THREAD DAMAGE WILL RESULT AND IS NOT COVERED UNDER WARRANTY. REFER TO THE BATTERY INSTALLATION GUIDE OR MANUFACTURERS SPECIFICATIONS FOR PROPER TIGHTENING TORQUE.

6. Connect the Vesta Power Module's POSITIVE DC cable to the upper battery's POSITIVE terminal using the battery terminal bolt, flat washer, and split ring washer on top of the cable lug (supplied). Tighten the bolt to the battery manufacturer's torque specifications.

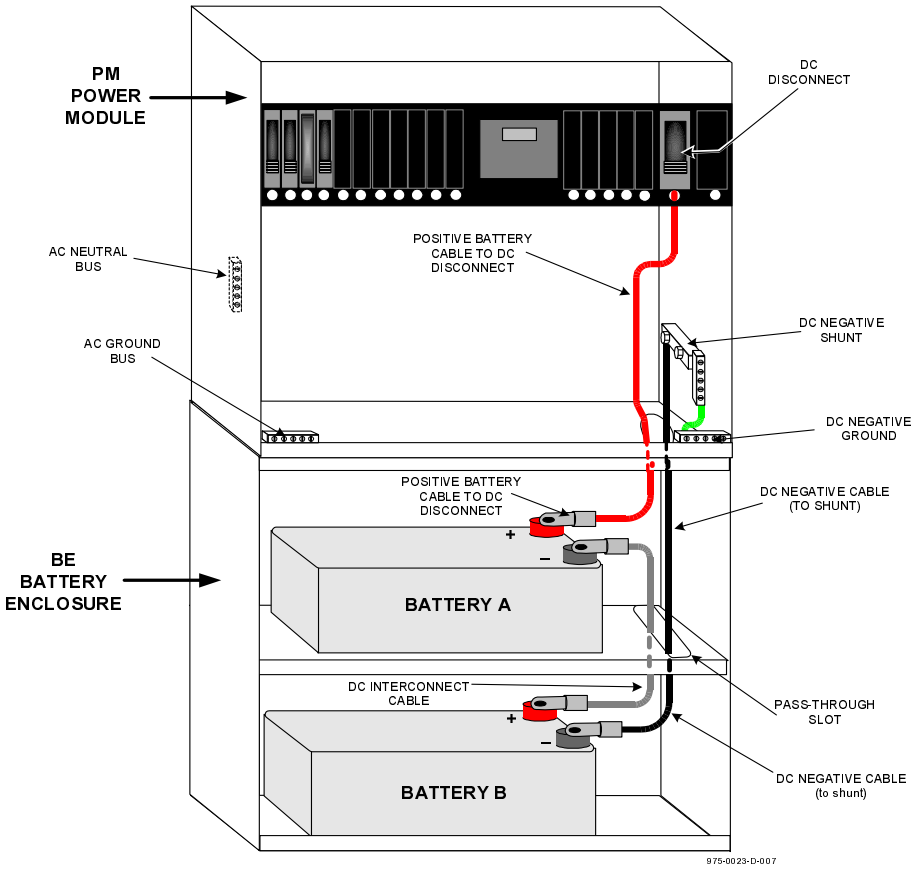
7. Ensure the batteries are centered on the shelf in the BE enclosure and the cable lugs do not contact any other component inside the enclosure.

8. Connect the Vesta Power Module's NEGATIVE cable to the battery's NEGATIVE terminal using the battery terminal bolt, flat washer, and split ring washer on top of the cable lug (supplied). Tighten the bolt to the battery manufacturer's torque specifications.

NOTE: If a second BE enclosure is added to the stack (under the stack) or on the side of the existing BE enclosure, battery run times can be extended. This second BE module should be wired in a parallel configuration. See Figure 2-17.

9. Run a GROUND wire to *ALL* battery enclosures and connect to the DC GROUND BUS in the PM. See Figure 2-21.

10. Install the Vesta BE Battery Enclosure front cover using the two screws removed earlier.



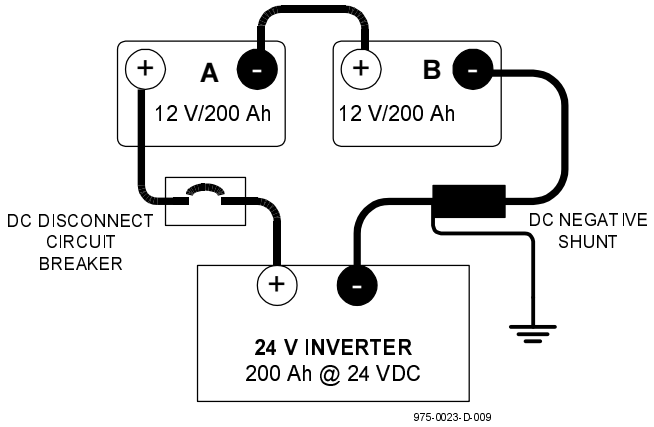
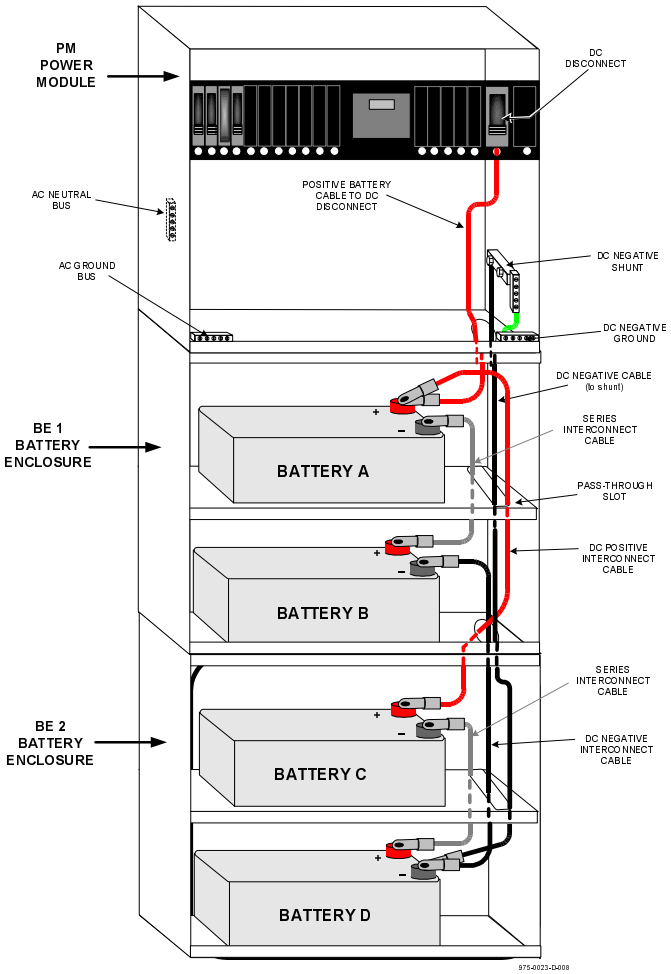


Figure 2-16
Wiring the Batteries for 24 VDC



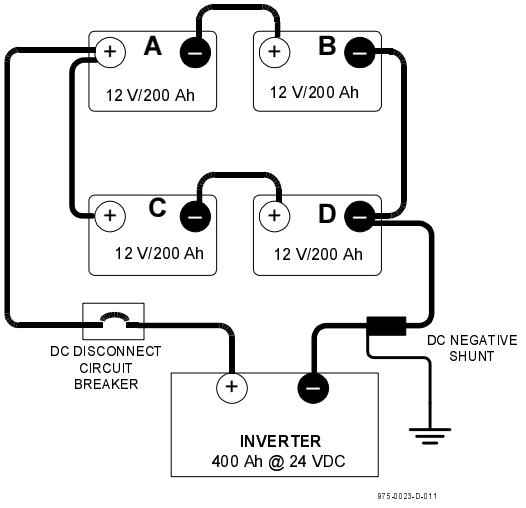


Figure 2-17
Wiring Batteries in Series/Parallel for 24 VDC

12 VDC Systems

Vesta 12 VDC systems typically use two, 12 volt, 200 amp-hour batteries connected in a parallel configuration inside one Vesta BE. A second BE enclosure can be added to extend run time by wiring two identical batteries pairs in parallel. The second parallel pair is then wired to the first pair in a parallel configuration.

NOTE: Other arrangements, using 2 or 6 volt batteries (to achieve 12 volts) are possible. Consult a Xantrex Dealer or installer for wiring details.

WARNING: DO NOT SHORT CIRCUIT THE BATTERY TERMINALS. FIRE OR EXPLOSION MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING: BATTERIES ARE EXTREMELY HEAVY. ALWAYS USE PROPER LIFTING TECHNIQUES AND HAVE HELP AVAILABLE WHEN INSTALLING BATTERIES INTO THE ENCLOSURES.

1. Ensure the Vesta DC disconnect is switched OFF.
2. Route the two DC cables from the Vesta Power Module enclosure down through the 2 inch conduit bushing located on the right-hand side of the enclosure. The negative cable is longer and should be routed down through the cable slot located on the right-hand side of the BE enclosure to the lower shelf.

WARNING: ENSURE THE CABLE ENDS DO NOT TOUCH THE BATTERY TERMINALS OR ANY METAL PART OF THE ENCLOSURE.

WARNING: ENSURE THE BATTERY TERMINALS DO NOT SHORT TO ANY METAL PARTS OF THE ENCLOSURE.

3. Unpack two 12 volt 200 Ah batteries. Place the batteries in the Vesta BE enclosure with the terminals located on the right-hand side. See Figure 2-18.

NOTE: If installing two BE modules (for a total of four batteries) Refer to Figure 2-19. The batteries are labeled: A–top shelf (BE 1), B–bottom shelf (BE 1), C–top shelf (BE 2) and D–bottom shelf (BE 2).

4. Locate the two, parallel battery interconnect cables and route it through the battery cable slot in the BE shelf.
5. Connect battery using an interconnect cable between battery A's POSITIVE terminal and battery B's POSITIVE terminal.
6. If the installation uses two BE modules with four batteries; see Figure 2-19.
   - Install all four batteries in the BE modules.
   - Connect battery B's POSITIVE terminal to Battery C's POSITIVE terminal.
   - Connect battery C's POSITIVE terminal to Battery D's POSITIVE terminal.

   All four battery's POSITIVE terminals are now connected in parallel.

Tighten the bolt to the battery manufacturer's torque specifications.

7. Connect the Vesta Power Modules (PM) POSITIVE DC cable to the POSITIVE terminal of battery A using the hardware supplied (terminal bolt, flat washer and split ring washer). Torque the bolt to the manufacturer's specifications (refer to the battery's instruction manual).

8. Use the parallel interconnect cable and connect battery A's NEGATIVE terminal to battery B's NEGATIVE terminal.

9. If the installation uses two BE modules with four batteries; see Figure 2-19.

   - Connect battery B's NEGATIVE terminal to Battery C's NEGATIVE terminal.
   - Connect battery C's NEGATIVE terminal to Battery D's NEGATIVE terminal.

   All four battery's NEGATIVE terminals are now connected in parallel.

10. Connect the Vesta Power Module's NEGATIVE DC cable to the NEGATIVE terminal of Battery D.

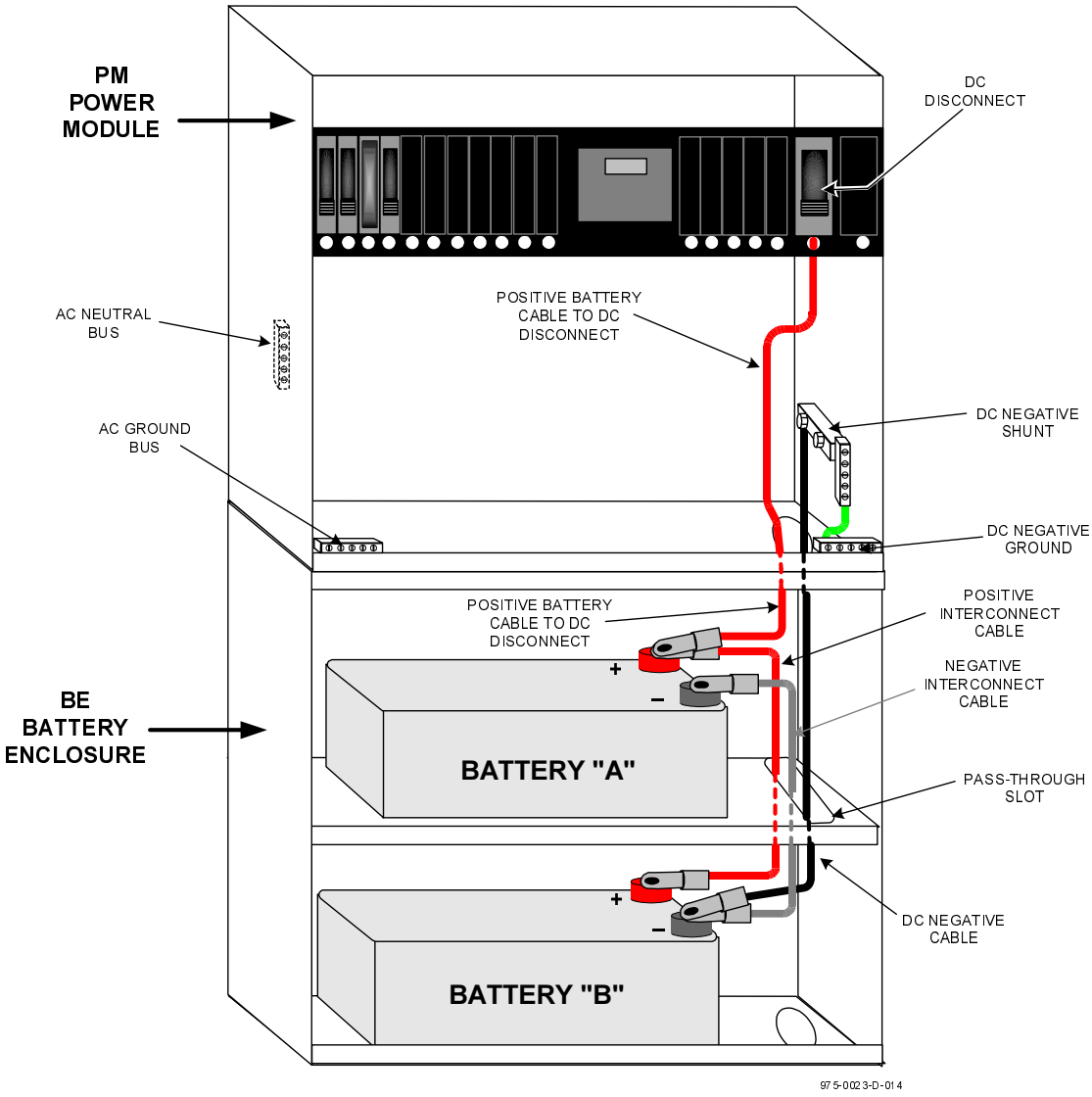
    - Torque all the terminal bolts to the battery manufacturer's specifications (refer to the battery installation manual).

CAUTION: DO NOT OVERTIGHTEN THE BATTERY BOLTS. TERMINAL THREAD DAMAGE WILL RESULT AND IS NOT COVERED UNDER WARRANTY. REFER TO THE BATTERY INSTALLATION GUIDE OR MANUFACTURERS SPECIFICATIONS FOR PROPER TIGHTENING TORQUE.

11. Run a GROUND wire to *ALL* battery enclosures and connect to the DC GROUND BUS in the PM. See Figure 2-21.

12. Ensure the batteries are centered on the shelves inside the BE enclosure and do not contact any other metal parts of the enclosure.

13. Install the Vesta BE battery module front cover using the two screws provided.



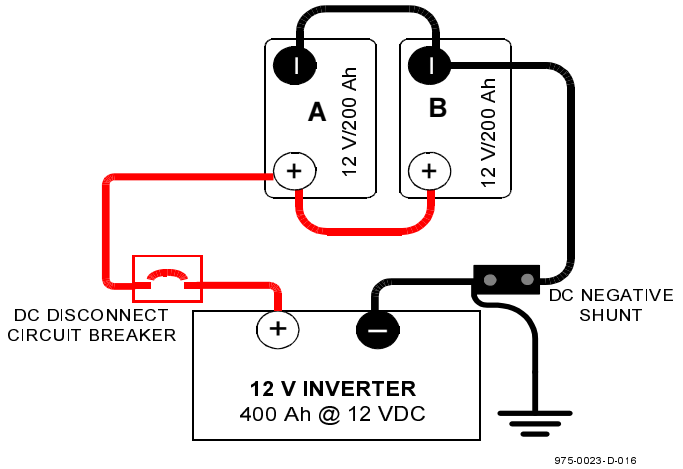


Figure 2-18
Wiring Batteries in Parallel for 12 VDC

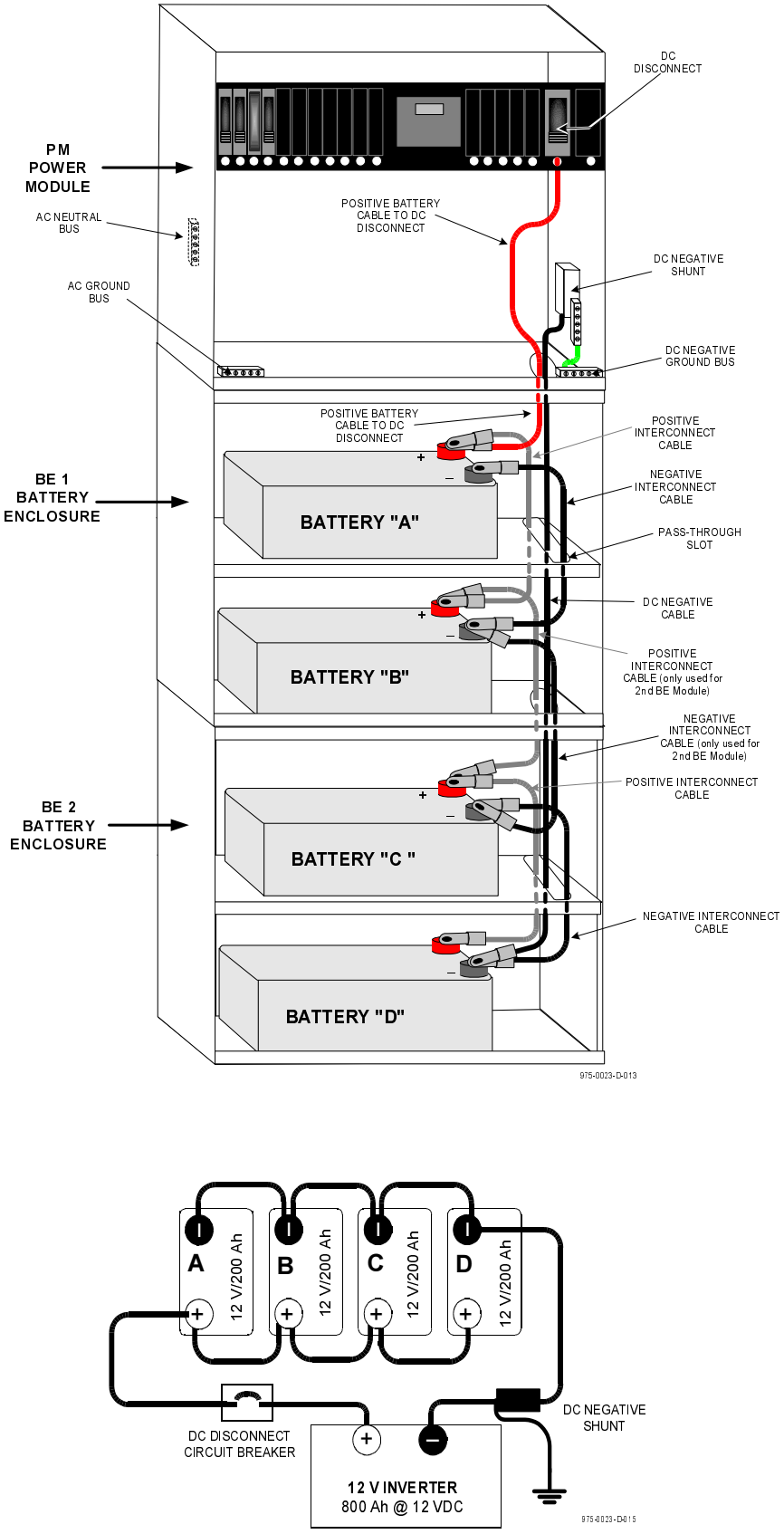


Figure 2-19
Wiring Batteries in Parallel for 12 VDC (extended run time)

48 VDC Systems

Vesta 48 volt DC systems (V0 5500S) require four, 12 volt batteries connected in a series configuration and two BE enclosures.

NOTE: Other arrangements using 2 or 6 VDC batteries (to achieve 48 volts) are possible. Consult a Xantrex Dealer or installer for wiring details.

WARNING: DO NOT SHORT CIRCUIT THE BATTERY TERMINALS. FIRE OR EXPLOSION MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING: BATTERIES ARE EXTREMELY HEAVY. ALWAYS USE PROPER LIFTING TECHNIQUES AND HAVE HELP AVAILABLE WHEN INSTALLING BATTERIES INTO THE ENCLOSURES.

1. Ensure the Vesta DC disconnect is switched OFF.
2. Route the two DC cables from the Vesta Power Module enclosure down through the 2 inch conduit bushing located on the right-hand side of the enclosure. The negative cable is longer and should be routed down through the cable slot located on the right-hand side of the enclosure to the BE 2's lower shelf.

WARNING: ENSURE THE CABLE ENDS DO NOT TOUCH THE BATTERY TERMINALS OR ANY METAL PART OF THE ENCLOSURE.

WARNING: ENSURE THE BATTERY TERMINALS DO NOT SHORT TO ANY METAL PARTS OF THE ENCLOSURE.

3. Unpack four 12 volt 200 Ah batteries. Place the batteries in the Vesta BE enclosure with the terminals located on the right-hand side, see Figure 2-20.

NOTE: Label the batteries for reference: A–top shelf (BE 1), B–bottom shelf (BE 1), C–top shelf (BE 2) and D–bottom shelf (BE 2).

4. Connect the NEGATIVE terminal of battery A to the POSITIVE terminal of battery B using a series interconnect cable.
5. Connect the NEGATIVE terminal of battery B to the POSITIVE terminal of battery C using a series interconnect cable.
6. Connect the NEGATIVE terminal of battery C to the POSITIVE terminal of battery D using a series interconnect cable.
7. Connect the Vesta Power Module's POSITIVE DC cable to the POSITIVE terminal of battery A.
8. Connect the Vesta Power Module's NEGATIVE DC cable to the NEGATIVE terminal of battery D.
9. Use the supplied hardware (bolt, split washer and washer) and tighten the bolt to the battery manufacturer's torque specifications.

CAUTION: DO NOT OVERTIGHTEN THE BATTERY BOLTS. TERMINAL THREAD DAMAGE WILL RESULT AND IS NOT COVERED UNDER WARRANTY. REFER TO THE BATTERY INSTALLATION GUIDE OR MANUFACTURERS SPECIFICATIONS FOR PROPER TIGHTENING TORQUE.

10. Ensure the batteries are properly centered on the shelf and the cable lugs do not contact any metal parts of the enclosure.

11. Run a GROUND wire to *ALL* battery enclosures and connect to the DC GROUND BUS in the PM. See Figure 2-21.

12. Install the Vesta module front covers with the screws removed earlier.

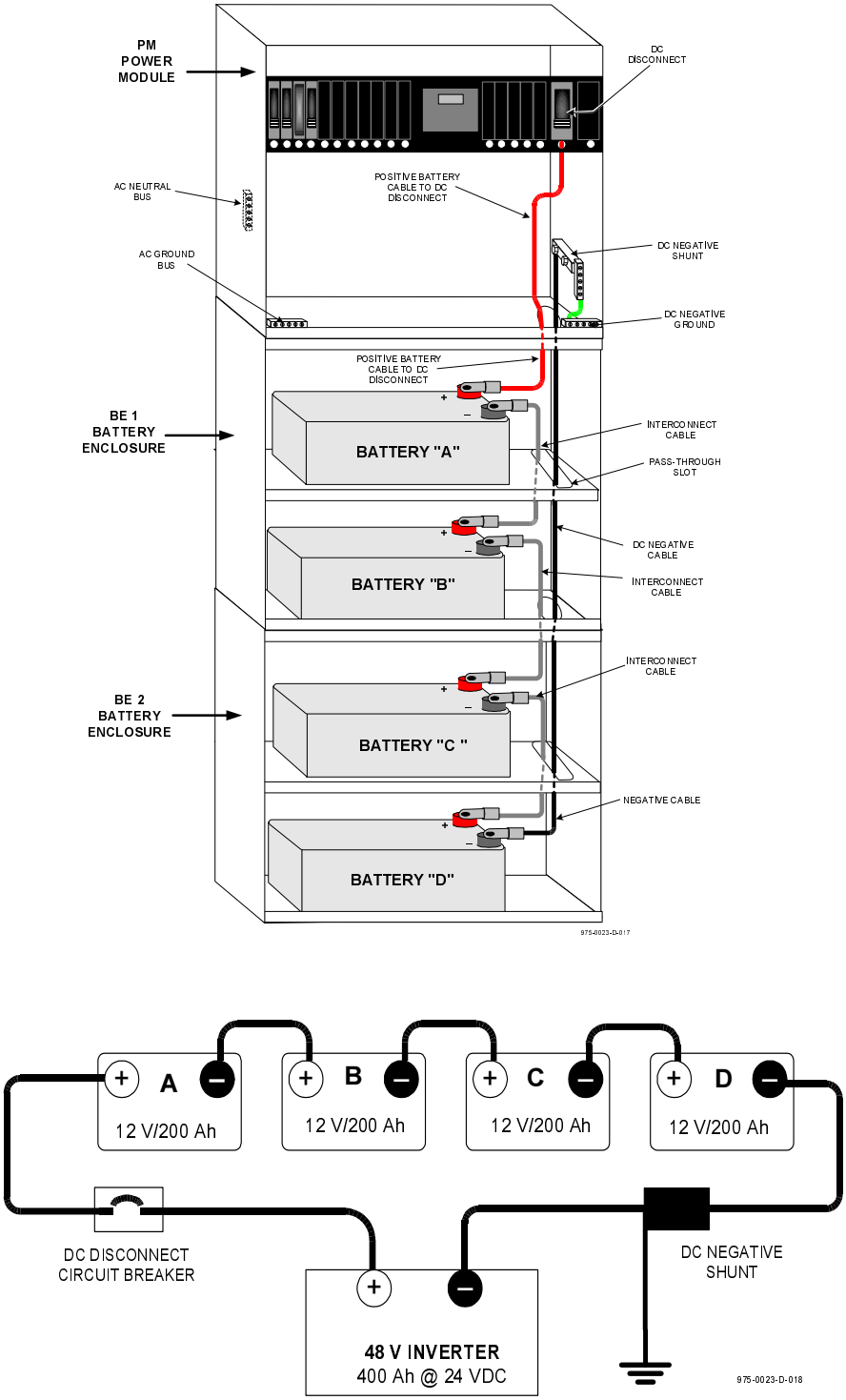


Figure 2-20
Wiring Batteries in Series for 48 VDC

System Grounding

AC Grounding

The PM/BE system MUST be grounded to the utility by connecting the utility ground wire to the AC GROUND bar in the Power Module. This ground strip must also be connected to the load circuits.

DC Grounding

The Battery Enclosures MUST be grounded together via a separate ground wire and connected to the DC GROUND bar in the Power Module. Torque all ground wires in the bus bars to 25 lb-in (2.8 N-m). A stud is provided on the inside top right-hand side of the BE enclosures for connecting a ground wire.

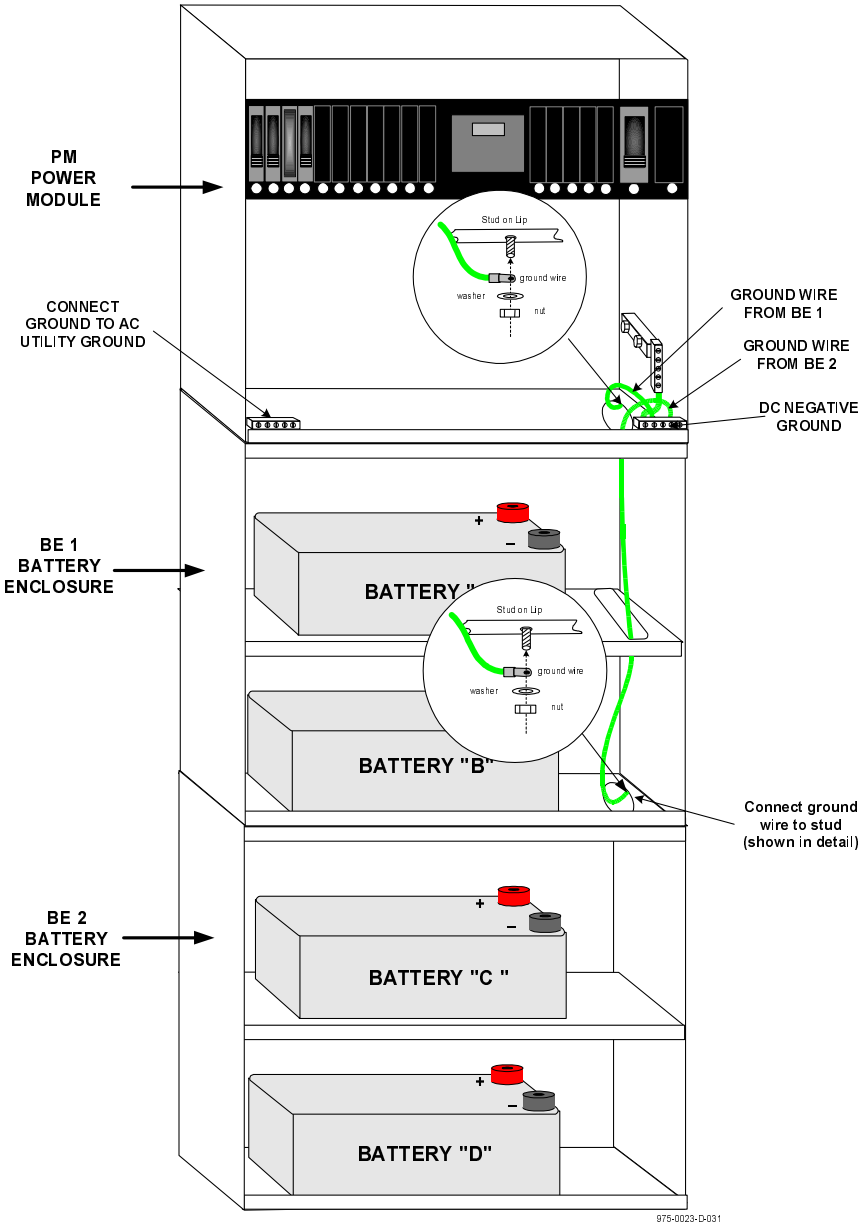


Figure 2-21
Actual Battery Wiring in BE

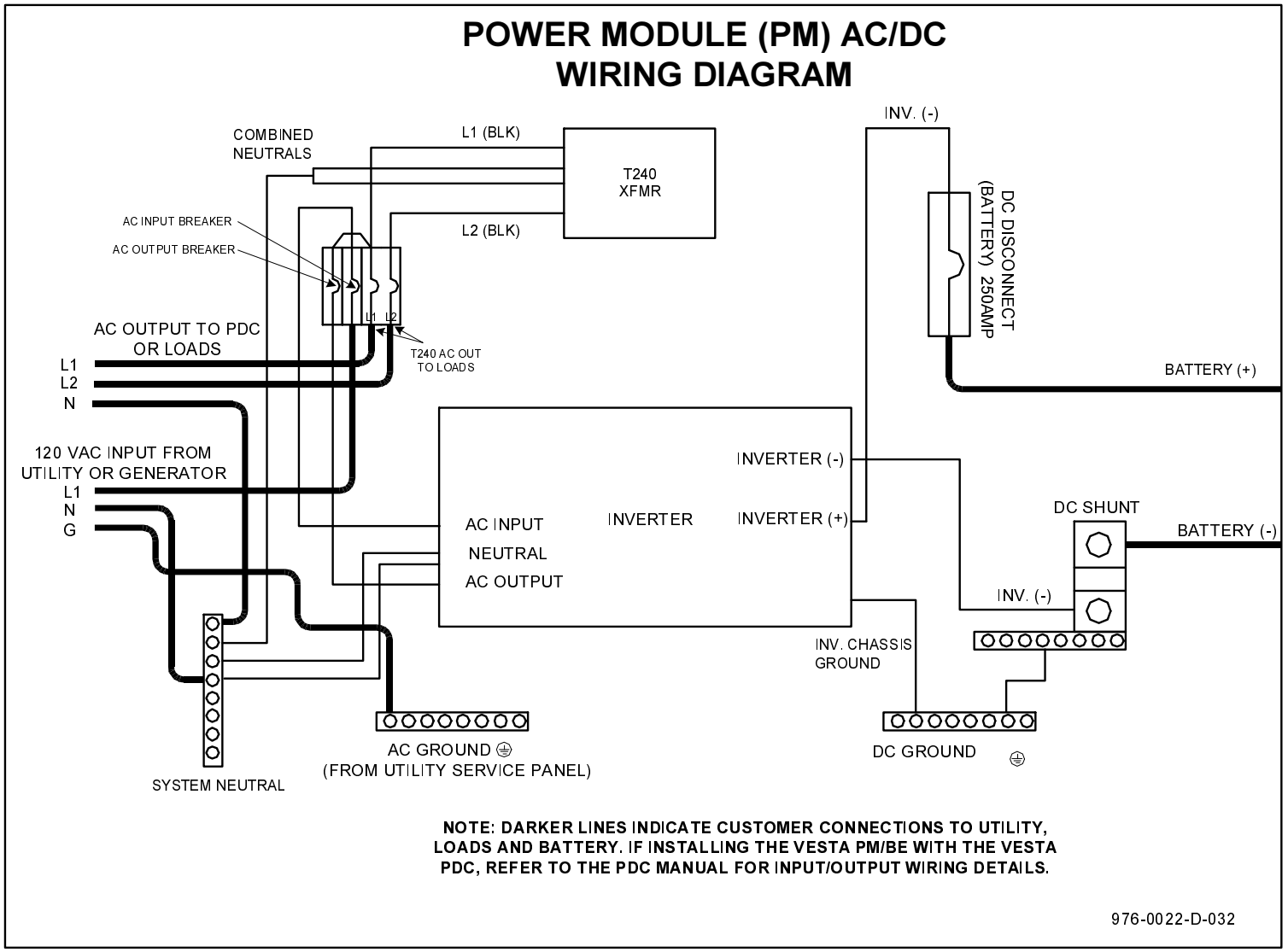


Figure 2-22
Power Module Wiring Diagram

Start-up and Test

The start-up instructions presented in this section will differ slightly between the various Vesta Power Modules due to the type of Xantrex inverter used in the Power Module. Please refer to the relevant section for specific PM start-up instructions. Additional information for inverter settings can be found in the inverter/charger Operator's or User's manuals supplied with the Vesta Power Module.

All Vesta PM units are supplied with AC INPUT and OUTPUT breakers, DC disconnect and a control panel (depends on inverter module).

All AC input and output wiring is described in the previous Installation section.

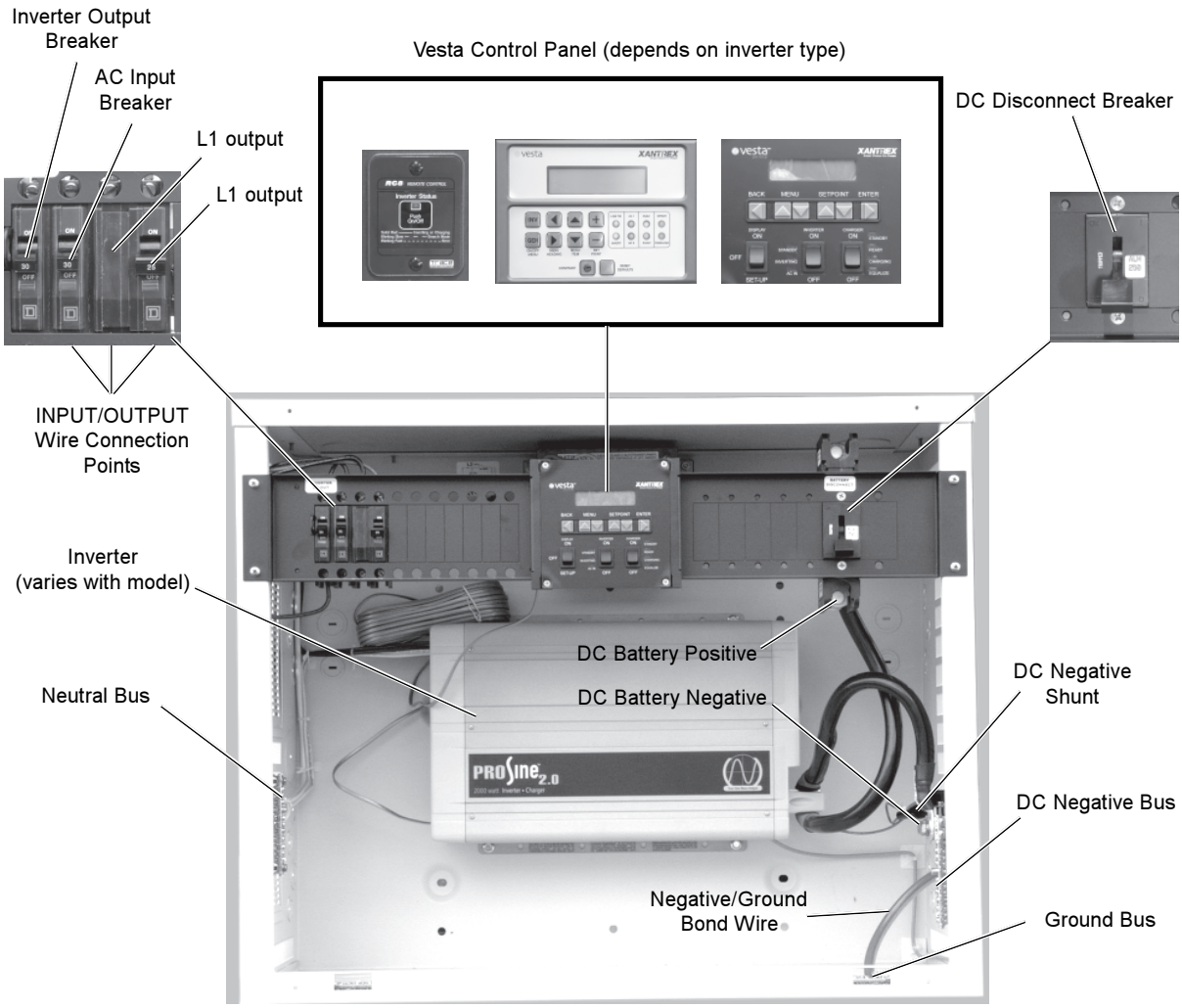


Figure 3-1
Power Module Components

Description of Circuit Breakers

The circuit breakers on the Vesta front panel control various inputs and outputs to and from the inverter. For proper operation *ALL* circuit breakers should be ON (upper position).

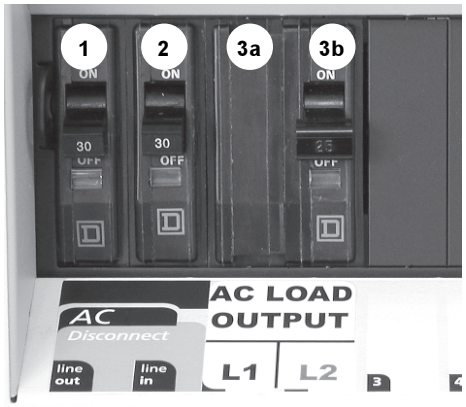
The following is a description of the circuit breakers.

1. This circuit breaker controls the *OUTPUT* from the inverter to the internal T240 transformer. When this breaker is switched OFF no output will be applied to the load; however, the inverter will still be providing 120 VAC to this circuit breaker.

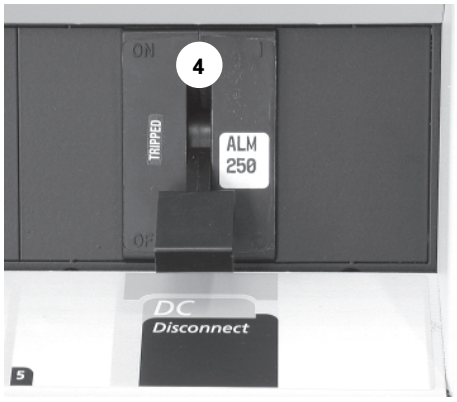
2. This circuit breaker controls the AC input to the inverter from the electrical panel or PDC. When this breaker is switched OFF, no AC voltage is applied to the inverter; however, the output of the inverter may still be providing 120/240 VAC to the loads from the batteries.

3. This circuit breaker is dual-pole, single throw, with the control switch on breaker 3b. When this breaker is switched OFF, *all* 120/240 VAC output to the loads is disconnected. The inverter may still be operating from the line or battery voltage.

4. This circuit breaker controls the DC voltage to/from the batteries. When this breaker is OFF the inverter can not run in backup mode; however, the inverter may still be active from the utility or generator input.



AC Circuit Breakers



DC Circuit Breaker

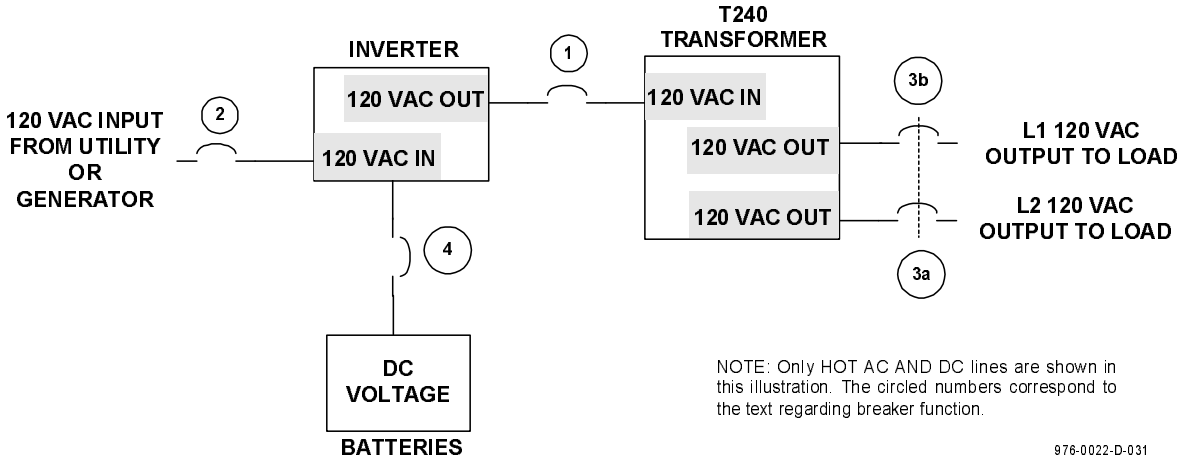


Figure 3-2
Circuit Breaker Function and Block Diagram

Vesta Online 1500, 2400 and 3600 Models–Start-up Procedure

These models incorporate the Xantrex 24 volt DR inverter/charger models. Refer to the instructions below for setting the inverter for optimum performance for the BATTERY BANK CAPACITY (two 12 V/200 Ah batteries = 24 VDC/200 Ah, four 12 V/200 Ah batteries = 24 VDC/400 Ah).

CAUTION: REFER TO THE PROPER BATTERY WIRING CONFIGURATION INSTRUCTIONS AND DIAGRAMS IN THE INSTALLATION SECTION OF THIS MANUAL.

WARNING: REMOVE ALL JEWELRY BEFORE PLACING YOUR HAND IN THE MODULE.

1. Remove the PM module cover.
2. Refer to Figure 3-3 and set the BATTERY CAPACITY dial on the inverter to:
   - 200 Ah for two batteries in series or,
   - 400 Ah for four batteries in series/parallel.
3. Set the OVER-DISCHARGE protection (AC TRANSFER VOLTAGE) to the center of its range.
4. Set the BATTERY CHARGER RATE to the center of its range.
5. Set the BATTERY TYPE SELECTOR to 6. “LEAD CALCIUM/MAINTENANCE FREE.”
6. Set the SEARCH MODE WATTS to DEFEAT.

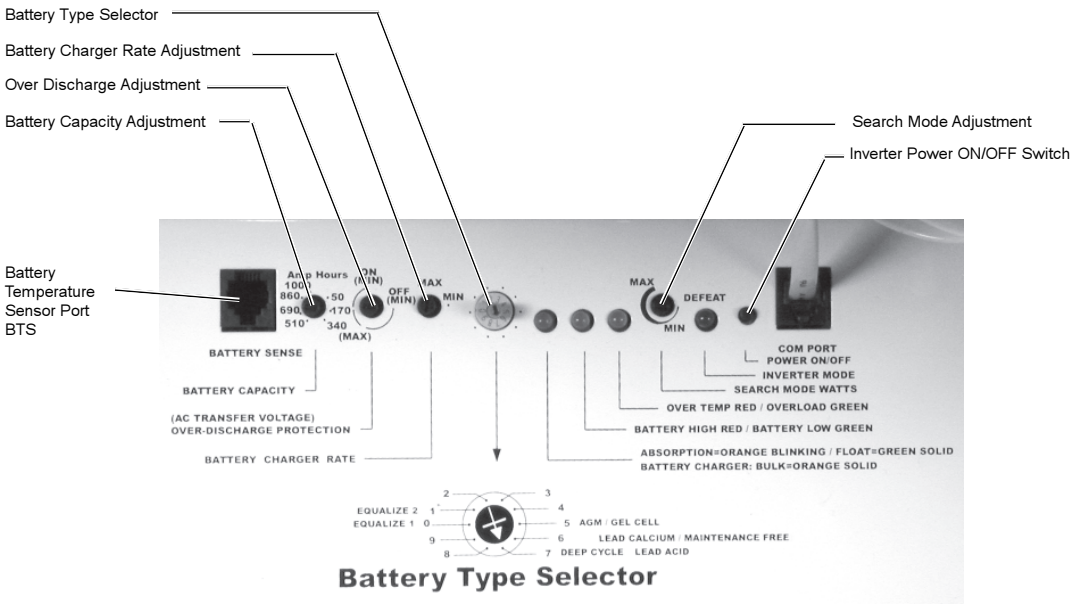


Figure 3-3
DR Adjustments for Setup

WARNING: DC AND AC POWER WILL BE SUPPLIED TO THE PM MODULE IN THE FOLLOWING STEPS. BE EXTRA CAUTIOUS WHEN PLACING YOUR HANDS INSIDE THE PM MODULE.

7. Switch ON the DC DISCONNECT breaker (4) located on the front panel of the Vesta Power Module. Battery power is now supplied to the Vesta Power Module. Observe the LED's on the panel of the inverter.

   - The LED's will cycle for a few seconds and several clicks may be heard as the relays are tested.
   - After 10 seconds, all LED's should be OFF.

NOTE: Refer to the DR Operator's manual for more detailed instructions if necessary.

8. Press the ON/OFF momentary switch located on the Vesta control panel to ON (see Figure 3-5). This starts the Vesta power module's inverter. The front panel switch indicator LED should be ON.

9. Switch the Vesta AC LINE OUT (1) and AC LOAD OUT (3b) breakers to ON. 120/240 VAC output power is now being provided by the inverter. Verify the Power Module is providing 120/240 VAC to the load circuits using an true rms AC voltmeter or 100 W load (such as a lamp).

10. Switch ON the main building AC circuit breaker and the Vesta 30 amp feed breaker (located in the main electrical panel). The 30 amp Vesta feed breaker may be located in the PDC if the PDC and GT option is installed.

11. Switch the Vesta AC IN breaker (2) to ON. This supplies AC utility power to the inverter, utility pass-through to the loads and starts battery charging.

    Verify the following LED's status:

    - The INVERTER LED goes OFF.
    - The BATTERY CHARGING LED (orange) will illuminate (solid or flashing).
    - If the PDC is installed with the Vesta DPM battery monitoring display, the charging current in amps can be viewed on the display.

NOTE: If the start-up sequence does not match the expected results, refer to the DR Owner's manual for troubleshooting information or contact Vesta technical support. Additional information on battery banks, loads, etc. can be found in the DR inverter Owner's manual.

12. Install the Vesta PM Front Cover.

Figure 3-4
Front Panel AC and DC Breakers

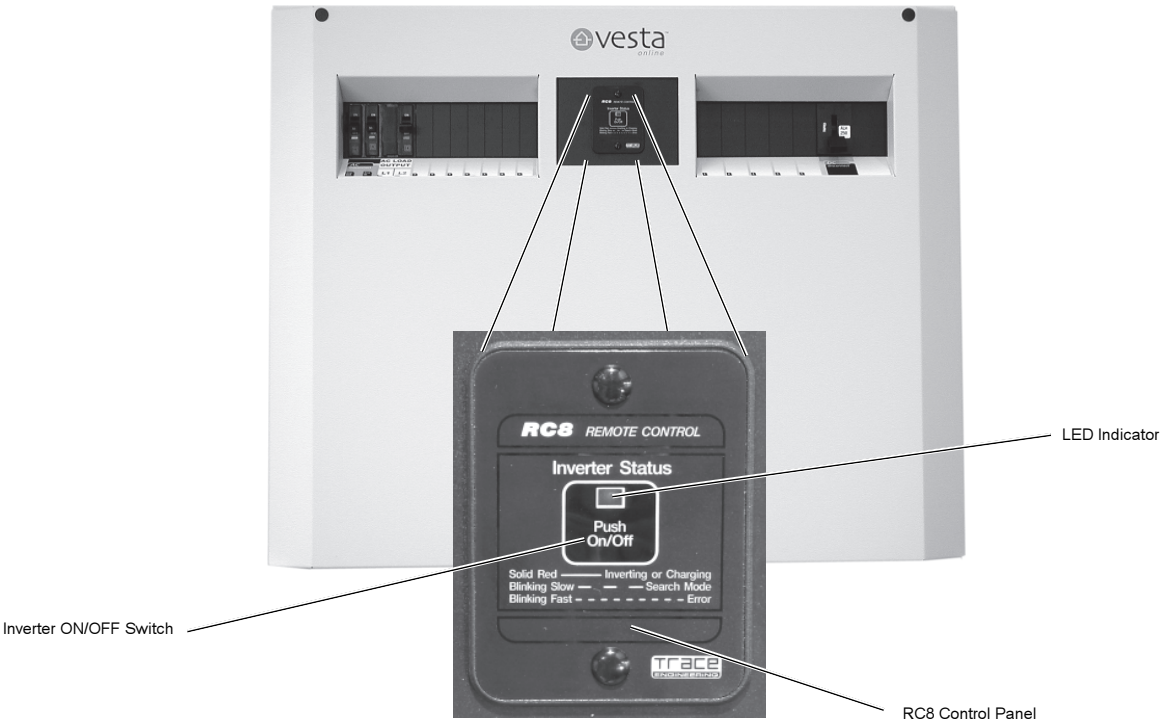


Figure 3-5
PM Module and RC8 Control Panel

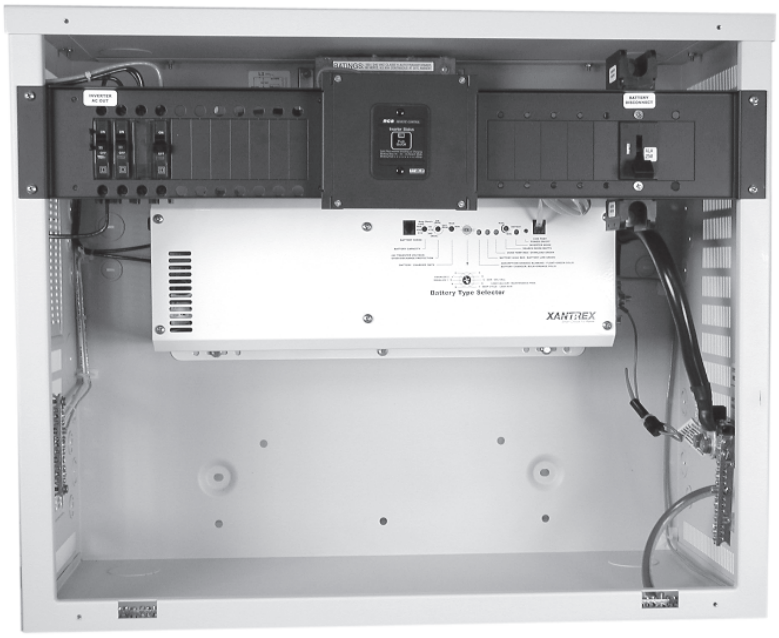


Figure 3-6
PM Module with DR Inverter/Charger

Vesta Online 2000S Models–Start-up Procedure

The VO 2000S models incorporate the Xantrex 12 volt PROSine 2.0 inverter/charger models. These systems are typically configured with two 12 volt/200 Ah batteries in parallel creating a 12 volt/ 400 Ah battery bank. The Vesta module is shipped with preset factory settings for maximum system performance. If specialized settings are required, refer to the PROSine 2.0 User's manual.

CAUTION: REFER TO THE PROPER BATTERY WIRING CONFIGURATION INSTRUCTIONS AND DIAGRAMS IN THE INSTALLATION SECTION OF THIS MANUAL.

WARNING: REMOVE ALL JEWELRY BEFORE WORKING IN THE MODULE.

1. Remove the PM module cover.
2. Switch ON the DC disconnect breaker (4) to supply battery power to the inverter.
3. Switch ON the PROSine inverter using the switch located on the left-hand side of the inverter. See Figure 3-9.
4. Switch the Vesta inverter display to "CONFIGURE." See Figure 3-8.
5. Refer to the PROSine 2.0 User's manual for setup details and options. When the setup is confirmed or completed, switch "DISPLAY" to "ON."
6. Switch the "INVERTER" and "CHARGER" to "ENABLE" on the Vesta Power Module front panel display.
7. Switch ON the Vesta AC DISCONNECT (1) and AC LOAD OUTPUT (3b) breakers. Verify the Power Module is providing 120/240 VAC to the load circuits using a true rms AC voltmeter or 100 W load (such as a lamp).
8. Switch ON the main building and 30 amp Vesta supply breaker (located in the main electrical panel). If a PDC is installed, the Vesta supply breaker is located in the PDC generator transfer panel, labeled "BATTERY CHARGER."
9. Switch ON the Vesta LINE IN breaker (2). This provides utility power to the inverter and loads, plus charges the batteries. The transfer time to switch to utility power is approximately 10 seconds. When the Power Module is in the utility mode, the "AC IN," BATTERY CHARGING (or READY) indicator, and INVERTER STANDBY LED's should be ON.

NOTE: If the PDC is installed with the Vesta VO DPM (Digital Power Meter) display, the battery charging amperage may be viewed on its digital display.

NOTE: If the start-up sequence does not match the expected results, refer to the PROSine 2.0 User's manual for troubleshooting information or contact Vesta technical support. Additional information on battery banks, loads, etc. can be found in the PROSine User's manual.

Figure 3-7
PM Module and Vesta Control Panel

Figure 3-8
PM Module and Vesta Control Panel

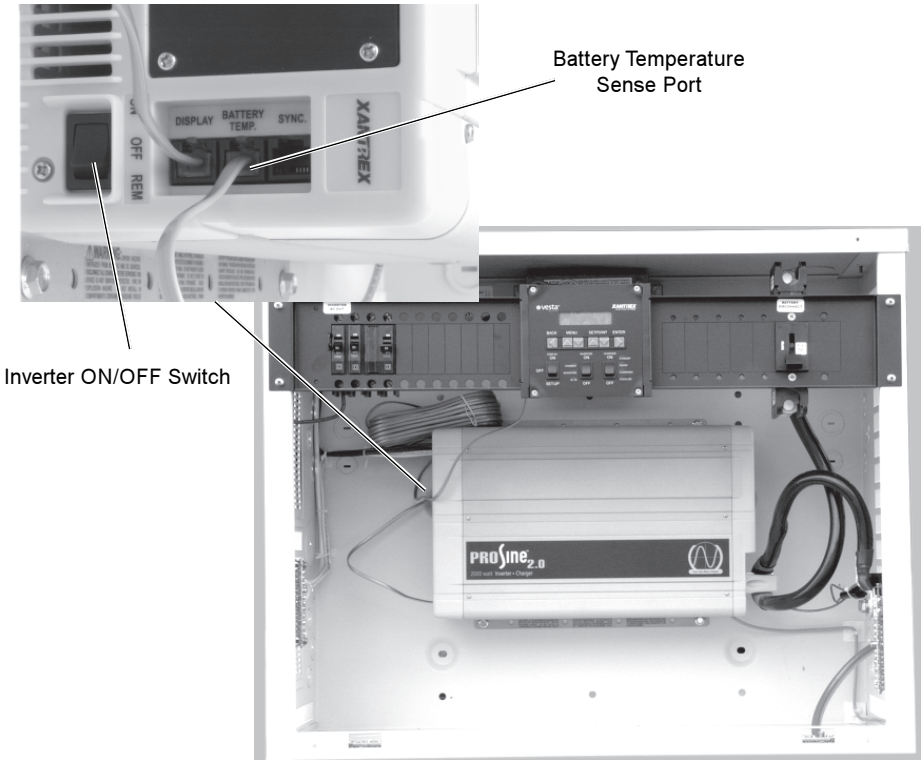


Figure 3-9
PM Module with PROSine Inverter/Charger

Vesta Online 4000S and 5500S Models–Start-up Procedure

These models incorporate a Xantrex 24 volt SW4024 or, a 48 volt SW5548 inverter/charger models. Twenty-four volt systems are typically configured with two 12 volt/200 Ah batteries in series creating a 24 volt/200 Ah battery bank. An additional set of identical batteries can be wired in parallel, thus increasing the capacity to 24 volt/400 Ah. The Vesta VO 5500S series, typically use four 12 volt/200 Ah batteries connected in series for a 48 volt/200 Ah configuration.

The Vesta module is shipped with preset factory settings for maximum system performance. If specialized settings are required, refer to the SW Sinewave Operator's manual.

CAUTION: REFER TO THE PROPER BATTERY WIRING CONFIGURATION INSTRUCTIONS AND DIAGRAMS IN THE INSTALLATION SECTION OF THIS MANUAL.

WARNING: REMOVE ALL JEWELRY BEFORE WORKING IN THE POWER MODULE.

1. Remove the PM module cover.
2. Switch ON the DC disconnect breaker (4) to supply battery power to the inverter.
3. Switch ON the inverter using the Vesta CONTROL PANEL. Press the red ON/OFF MENU button until "ON" is displayed in the LCD panel. This will turn the inverter ON. The yellow INVERTING LED on the CONTROL PANEL comes ON indicating the Power Module's inverter is supplying AC power *from* the batteries.

NOTE: Additional settings can be programmed using the Vesta's CONTROL PANEL if desired. Please refer to the SW Operator's manual for details.

4. Switch the Vesta LINE OUT (1) and AC LOAD OUTPUT (3b) breakers to ON. The PM module should be providing 120/240 VAC to the load circuits.
   - Verify the load circuits are powered by using an AC voltmeter or 100 watt lamp.
5. Switch ON the main building breaker in the service panel. Switch ON the dedicated 30 amp breaker in the main service panel. This breaker may be located in the PDC if it is installed with the GT option.
6. Switch ON the Vesta AC LINE IN breaker (2). Utility power is now being supplied to the Vesta's inverter. The inverter automatically transfers its output to the utility supplied power as follows:
   - After a short pause (while the inverter qualifies and synchronizes to the AC utility) the AC1 IN GOOD LED (green) illuminates.
   - The BULK (yellow) LED illuminates indicating the batteries are being charged in the bulk mode.
   - Verify the load circuits are still powered using a lamp or AC voltmeter.

NOTE: If the start-up sequence does not match the expected results refer to the SW Operator's manual troubleshooting section or contact Vesta technical support.

Figure 3-10
Front Panel AC and DC Breakers

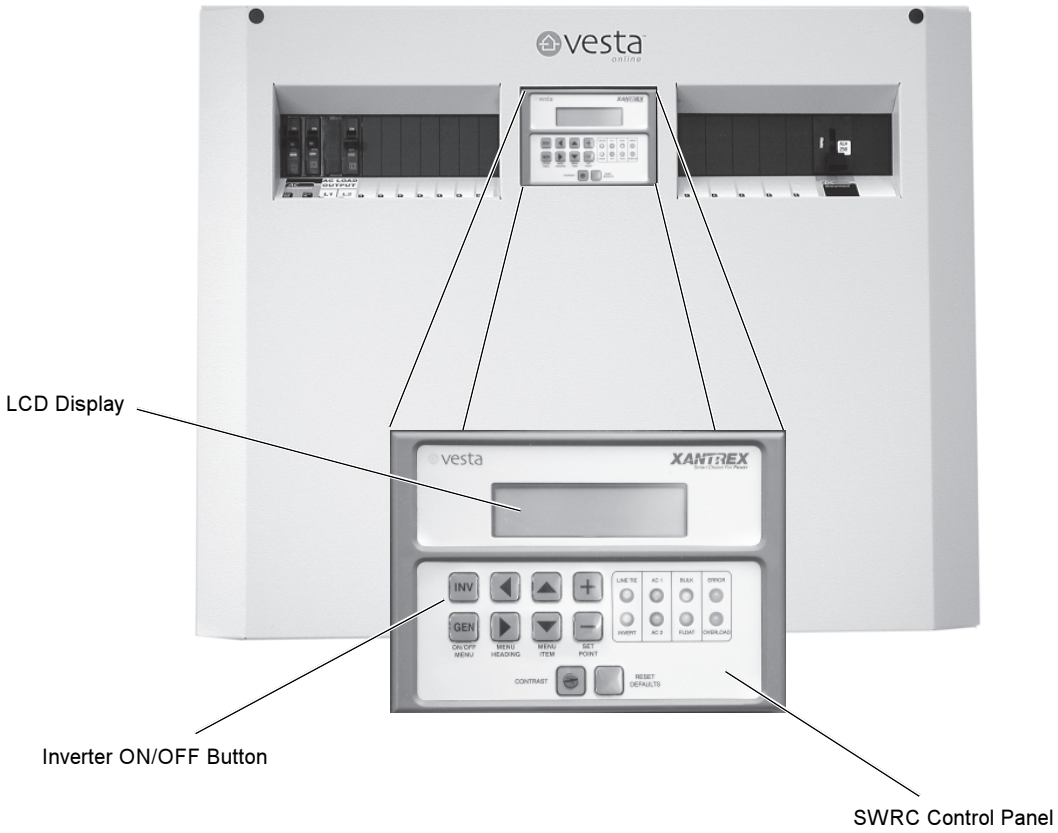


Figure 3-11
PM Module and SWRC Control Panel

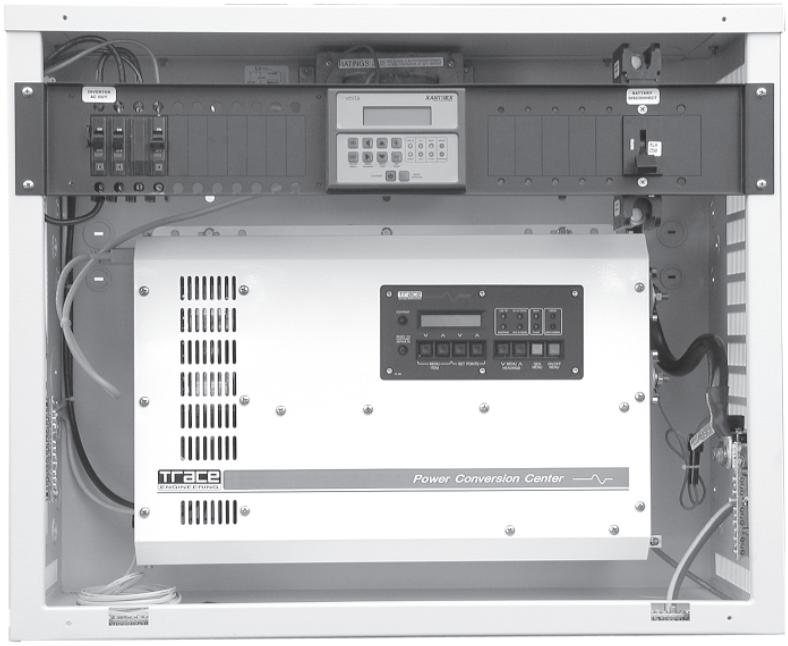


Figure 3-12
PM Module with Sinewave Inverter/Charger

3.0 OPERATION

The Vesta electrical/electronics system is designed to provide years of maintenance free standby backup power support. When utility power is available, the Vesta unit is in standby mode, allowing utility power to operate the loads and charge the batteries. When a power outage occurs, the Vesta Power module automatically transfers to battery backup power to operate the load circuits. Upon the return of the utility power, the Power Module will transfer back to utility power to supply the load circuits and resume battery charging.

The Vesta Power Distribution Center (PDC) provides many additional features to compliment the Power Module/Battery Enclosure stack. If a PDC is installed in the system, refer to the PDC Operator's manual for additional operating instructions.

Energy Efficient Improvements for Maximum Run Time

Most residences are designed with minimum or no power conserving systems due to the apparent unlimited amount of utility power available. When operating in the "backup mode," the priority AC load is being run from the batteries. Therefore, power conservation becomes extremely important during a power outage. The following recommendations include tips, techniques or products the can reduce your power consumption during an outage, allowing you to get the most benefit from the backup system.

- When an outage occurs:
    - Switch OFF any high power consumption and/or low priority loads such as portable electric heaters.
    - Switch OFF any computers if they are not being used or are not required to send or receive e-mails, faxes, files, etc.
    - Switch OFF any unnecessary lights (or use compact fluorescent bulbs which consume much less power and may also lower utility bills).
    - Install an automatic furnace thermostat and set it to a lower temperature while still providing reasonable comfort. Close heater vents and doors in unoccupied rooms during an outage to conserve heat in cold climates.
    - When choosing appliances such as refrigerator, freezer, etc. look for the higher efficiency models.
    - Have building assessed for thermal efficiency by a reputable provider. Select upgrades to windows, insulation, etc. to maximize furnace efficiency.

Limited Warranty

Xantrex warrants its Vesta electrical power products against defects in materials and workmanship for a period of one (1) year from the date of purchase, established by proof of purchase, and extends this warranty to all purchasers or owners of the product during the warranty period. The XS series batteries are covered by a separate battery warranty described in the XS installation guide. Xantrex does not warrant its products from any and all defects:

- arising out of material or workmanship not provided by Xantrex or its Authorized Service Centers;
- when the product is installed or exposed to an unsuitable environment as evidenced by generalized corrosion or biological infestation;
- resulting from abnormal use of the product, alteration or use in violation of the instructions;
- in components, parts or products expressly warranted by another manufacturer.

Should the Vesta inverter require service, the owner or installer is responsible for the costs incurred for removal, packing and freight to the Xantrex service facility, and reinstallation.

Xantrex agrees to supply all parts and labor to repair or replace defects internal to the inverter covered by this warranty with parts or products of original or improved design, at the company's option. Xantrex also reserves the right to improve the design of its products without obligation to modify or upgrade those previously manufactured. Defective products must be returned to Xantrex or its Authorized Service Center in the original packaging or equivalent. Labor to remove and/or replace the inverter is not covered by this warranty. The cost of transportation and insurance on items returned for service is the responsibility of the customer. Return transportation (UPS Ground or equivalent) as well as transport insurance on all repaired items is paid by Xantrex.

All remedies and the measure of damages are limited to the above. Xantrex shall in no event be liable for consequential, incidental, contingent or special damages, even if Xantrex has been advised of the possibility of such damages. Any and all other warranties, expressed or implied, arising by law, course of dealing, course of performance, usage of trade or otherwise, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose, are limited in duration for a period of one (1) year from the original date of purchase.

Some states or counties do not allow limitations on the term of an implied warranty, or the exclusion or limitation of incidental or consequential damage, which means the limitations and exclusions of this warranty may not apply to you. Even though this warranty gives you specific legal rights, you may also have other rights which vary from state to state.

XANTREX
*Smart Choice For **Power***

Xantrex Technology Inc., 5916 195th Northeast, Arlington, WA 98223, U.S.A. **t:** 360/435.8826 **f:** 360/435.3945
www.xantrex.com

4.0 WARRANTY

Life Support Policy

Xantrex does not recommend the use of any of its products in life support applications or direct patient care. This especially applies to situations where the product's failure or malfunction can be reasonably expected to cause the failure or malfunction of the life support device, or to significantly affect its safety or effectiveness.

Examples of life support devices include: neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as "critical" by the U.S. FDA.

Xantrex will not knowingly sell its products for use in such applications unless it receives, in writing, assurances satisfactory to The Company, that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of Xantrex is adequately protected.

Warranty Registration

To ensure proper registration, complete the Warranty Card and mail it to Xantrex within 10 days from the date of original purchase. Also, keep your bill of sale as proof of purchase.

Warranty Repairs must be performed only at an authorized Xantrex service center or at the Xantrex factory. Unauthorized repairs will void the warranty. A Return Merchandise Authorization (RMA) number must be obtained PRIOR to shipment and must be included with the returned product.

You can also register your product on-line at the Xantrex/Trace Web Site. Go to: www.xantrex.com or www.traceengineering.com and locate "quick links" on the home page. Click on the "Technical Support" window and select "Warranty Registration."

XANTREX
*Smart Choice For **Power***

Xantrex Technology Inc., 5916 195th Northeast, Arlington, WA 98223, U.S.A. **t:** 360/435.8826, **f:** 360/435.3945
www.xantrex.com

Overload Recovery

The output power of the Vesta Power Module can be distributed to the loads using up to eight 15-20 amp circuit breakers (i.e., Power Distribution Center, or sub-panel) each supplying a load circuit with AC power. The capacity of the installed inverter (12–45 amps or 1500–5500 watts) determines the total amperage which may be drawn at any one time. If the combined load (from all circuits) exceeds the rating of the inverter, it will shut down due to an overload condition. The solution is to reduce the load on the inverter by turning OFF some of the lower priority loads/ appliances and restarting the inverter.

The overload recovery procedure is as follows:

1. Switch OFF or unplug any noncritical high consumption loads/appliances connected to the backed up circuits (i.e., electric heaters, high amperage motors, etc.).

2. Switch OFF all the inverter load control breakers on the PDC (1-8) or AC OUT breakers on the Vesta Power Module.

3. Reset the inverter:

   - Vesta 1500, 2400 and 3600–Press the ON/OFF or RESET button on the Power Module.

   - Vesta 2000S–The inverter is programmed to restart automatically when the load breakers are switched OFF.

   - Vesta 4000S and 5000S will restart automatically due to brief overload conditions, or press the ON/OFF MENU button several times on the Vesta control panel.

NOTE: If the Vesta inverter does not start or a customized setup is required, refer to the inverter manual supplied for more detailed information.

4. Switch ON one load breaker at a time, at least 30 seconds intervals. This allows the Vesta to power up the loads gradually. While switching ON the load circuits, monitor the kW read out on the Vesta Online DPM (Digital Power Meter) if installed in the PDC (or monitor the AC amps display on the VO 2000S, 4000S and 5500S. The total current drawn, must not exceed the rating of the inverter:

   - 2000 watts/16 amps for Vesta 2000S

   - 4000 watts/33 amps for Vesta 4000S

   - 5500 watts/45 amps for Vesta 5500S

   - 2400 watts/20 amps for Vesta 2400

   - 3600 watts/30 amp for Vesta 3600

Loads such as furnaces, refrigerator, pumps cycle on and off after they have been in operation for a time. Once these loads are running and stabilized, additional load circuits *may* be switched into operation.

Battery Run Time Test

All batteries gradually degrade in capacity/run time due to frequency and depth of discharge as well as battery aging. Xantrex recommends inspecting the battery cable connections yearly to ensure they are tight and free of corrosion.

Since the electrical power requirements may change over time, a run time test can optionally be performed periodically to ensure the Vesta system has sufficient operating time to meet your requirements. A power outage run time test is easy to perform without removing power to the non backed up part of the electrical system. Run time is dependant on the total load operated and the present capacity of the battery bank. The run time test purposely allows the system to discharge it's battery bank using the critical loads connected (i.e., the inverter will cutoff AC power at an unknown moment). The test load should consist of the normally operating equipment, appliances, lights, etc. that will be operated during a utility outage from the Vesta module. This test should be performed during a noncritical time so the shut down does not interfere with normal operations.

The Vesta batteries must be fully charged before beginning the run time test (i.e., the battery charger is running in ready or float mode). If the Vesta Digital Power Meter is installed, the display will show the "%" capacity readout as "FULL."

a. Switch the Vesta feed breaker (in the main utility service panel) to OFF and note the time or begin a timer.

b. Operate the AC loads you would normally run during a power outage (switch OFF the noncritical loads to conserve battery power). This provides a good test of the available backup time, should an outage occur.

c. When the Vesta unit shuts down, the backup loads will stop operating. Record this time. The amount of hours the Vesta unit powered the loads from the time the breaker was turned OFF is the run time for the system during a utility outage.

d. Turn the Vesta feed breaker back ON to return to utility pass-through mode and battery recharging.

If the run time test is less than required or originally had, the batteries may need replacing. If the battery bank capacity has dropped to less than 70% of the original capacity, Xantrex recommends installing new batteries. If the system is new (i.e., less than 12 month old or registers greater than 95% of original capacity) additional Vesta BE Battery Enclosures may be added to increase run time. Do not mix "old" batteries with new batteries as this will accelerate the aging process of the new batteries. Contact Vesta service or support representative if a system upgrade is needed.

Electronic Inverter Service

The Vesta system is comprised of high quality components designed to provide years of reliable backup power performance. If the Vesta system fails to operate as expected, refer to the inverter manual troubleshooting section, contact your local Vesta service technician or contact Vesta technical support.

NOTE: All servicing for the Vesta residential or commercial electrical system should be performed by a qualified electrician.

Xantrex Technology Inc. takes great pride in its products and makes every effort to ensure your unit fully meets your independent powering needs.

If your product needs repair, contact our Service department at: (360) 435-8826 to obtain an RMA# and shipping information; or, fax this page with the following information to: (360) 474-0616.

Please provide:

Model Number: _____

Serial Number: _____

Purchase Date: _____

Problem: _____

Include a telephone number where you can be reached during business hours and a complete return shipping address (P.O. Box numbers are not acceptable).

Name: _____

Address: _____

City: _____

State / Province: _____

Zip / Postal Code: _____

Country: _____

Phone: (___) _____

FAX: (___) _____

E-mail Address: _____

XANTREX
Smart Choice For Power

Xantrex Technology Inc., 5916 195th Northeast, Arlington, WA 98223, U.S.A. **t:** 360/435.8826, **f:** 360/435.3945
www.xantrex.com

6.0 SPECIFICATIONS

Electrical Specifications

MODEL	VO 1500	VO 2000S	VO 2400	VO 3600	VO 4000S	VO 5500S
Wattage Output**	1300	1600	2200	3200	3600	4600
Max. Surge*	2400	4500	6200	7500	8000	9500
Waveform	Quasi	Sine	Quasi	Quasi	Sine	Sine
AC Output (VAC)	120/240	120/240	120/240	120/240	120/240	120/240
Internal 120 V Transfer	30 amps	30 amps	30 amps	35 amps	60 amps	60 amps
Charger Amps	35 amps	100 amps	70 amps	70 amps	120 amps	75 amps
DC Voltage	24 VDC	12 VDC	24 VDC	24 VDC	24 VDC	48 VDC

* Inverter 5 second rating
**Inverter continuous rating, runtime limited by battery capacity

Mechanical Specifications

Weight	125 lb (57 kg)	120 lb (54 kg)	130 lb (59 kg)	140 lb (64 kg)	220 lb (100 kg)	235 lb (107 kg)
Enclosure Size (H x W x D)	24" x 29.5" x 14.8" (37.6 cm x 75 cm x 61 cm)					

Options

Power Distribution Center (PDC)

Specifications subject to change without notice.
Specifications @ 25 °C

Xantrex Technology Inc.
5916 195th Northeast
Arlington, WA 98223
U.S.A.
t: 360/435.8826
f: 360/435.3945
www.xantrex.com

P/N 975-0033-01-01 Rev. A 05/01

Printed in U.S.A.

XANTREX
Smart Choice For **Power**