



# VO-PDC

*Power Distribution Center*



## Installation Guide

**Vesta Online**  
**Power Distribution Center**  
**VO-PDC**

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### **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.

**SAVE THESE INSTRUCTIONS**

# IMPORTANT SAFETY 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 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 indoor installation in a dry location.
- 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.
- Backup, or 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. Service/repair of the inverter must be performed at a Xantrex service center.
- 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.



Thank you for purchasing the Vesta Power Distribution Center (PDC) 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 achieve high reliability. The PDC is specifically designed for use with the Vesta Power Modules. It is NOT intended for use with stand-alone inverters without internal transfer switches.

The PDC-RI is a basic (or rough-in) backup power panel that can be installed in new building construction and can be upgraded in the future with a Vesta PDC-RB relay board transfer kit. The RB option incorporates automatic transfer to backup power, for up to eight circuits, during a utility outage when used with the Vesta power and battery (PM/BE) modules. The PDC-GT generator input/manual transfer panel kit, allows generator power to be easily switched-in to operate the backed up loads should the batteries drain to a low level as in an extended power outage. A portable, 5 kW 120/240 VAC generator can easily be connected outside the building using the remote generator inlet (30 amp, 120/240 VAC), included with the GT kit. The VO-DPM digital power meter kit adds a display showing the percent of power remaining based on precise battery capacity monitoring.

The Vesta PM power and BE battery modules provide the AC power through advanced inverter and battery technology. The PM/BE modules should be sized to provide AC backup power based on maximum wattage, hours of run time and features required.

The complete Vesta Power Distribution Center (RI plus RB, GT and VO-DPM kits installed) provides the following features:

- 60 amps–120/240 VAC pass through to critical loads.
- 30 amps–dedicated generator panel with manual generator transfer switch. This option accepts 1–3 additional auxiliary or generator supplied Square D QOU breakers (installer supplied).



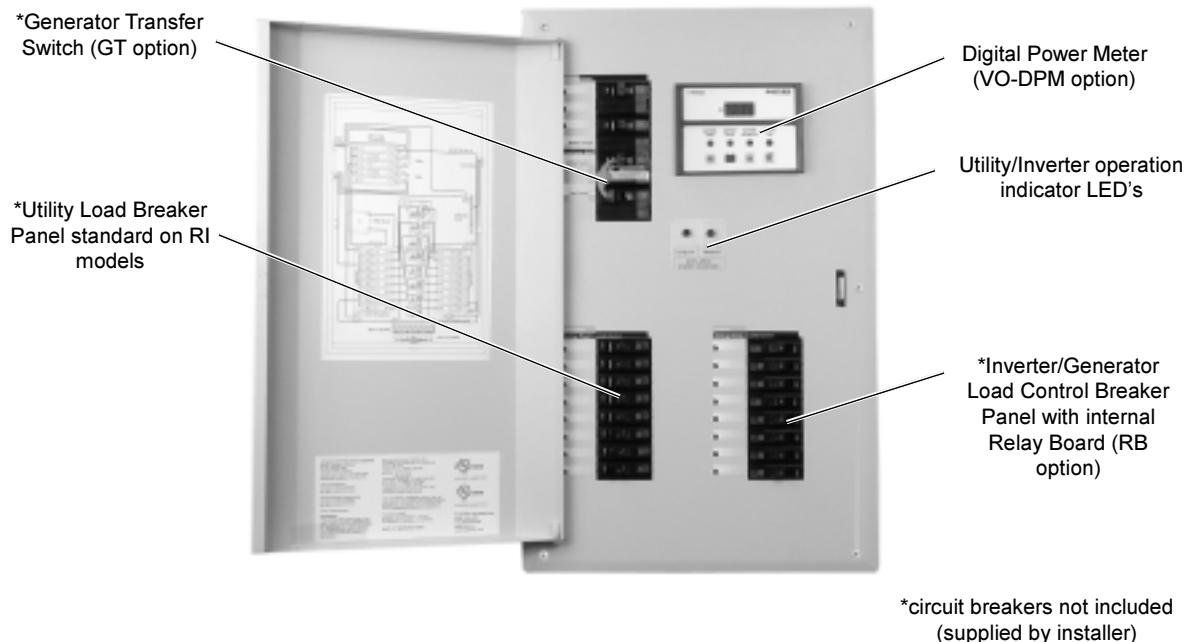
**NOTE:** For generators above 7 kW (such as 8 kW–35 A) install suitable wire and protection.

- Utility fed load control panel for critical loads. This option accepts up to eight, 15-20 amp, Square D QO breakers (installer supplied).
- Four, dual-pole, load level, 20 amp power transfer relays.
- Inverter/generator fed load control panel for critical loads. This option accepts up to eight, 15-20 amp Square D QO breakers (installer supplied). These breakers also provide Vesta inverter/generator load management control.
- Remote 120/240 VAC, 30 amp generator inlet receptacle.
- Real-time Digital Power Meter (battery capacity) with remote mount option (VO-DPM).
- Listed to UL and CSA standards



**NOTE:** Please read *ALL* sections of this manual for the options that are to be installed. Some options require *rewiring* from the basic RI (rough-in) and RB (relay board) installations. While the rewiring is not extensive and is all performed within the PDC, it will save time to read and plan ahead.


## 1.0 PDC INTRODUCTION



**Figure 1-1**  
**Vesta PDC (including the RB, GT, and VO-DPM options)**

### Unpacking and Inspection

- Carefully unpack the power distribution center (PDC) from its shipping carton.
- 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 differ slightly from your unit. Xantrex Technology Inc. reserves the right to update this product without notice.

### Pre-installation

#### Tools required:

#2 Phillips screw driver	Level
Slotted screw driver	Wire strippers
Assorted open-end wrenches	Torque wrench
Socket wrench and fittings	Electrical tape
Multimeter (True rms)	Pencil
Hole saw	Utility knife

#### Hardware / Materials required:

#12 wood screws (or 1/4" x 1-1/4" lag bolts)  
Conduit and appropriate fittings (if required)  
Wire nuts

#### Location

- In new construction, the Vesta PDC can be installed in any dry, indoor area where it is convenient to access the circuit breakers for load or generator control. In existing buildings, the PDC can be located close to the main electrical panel to minimize wire runs.

#### Additional Materials

- An additional two-pole, 60 amp circuit breaker must be installed in the main electrical panel for supplying the PDC's load circuits and *possibly* a 30–60 amp single-pole breaker for the Power Module and Battery Charger. Review the sections of this manual for the requirements of the options (if any) to be installed.
- Up to 16, 15–20 amp Square D, QO type circuit breakers are required for load control (or a combination of single and double-pole breakers for 240 VAC operation). The PDC is not shipped with these circuit breakers and must be installer supplied.



**NOTE:** If the Generator Transfer Assembly is being installed, up to three additional 15-20 amp Square D, QOU circuit breakers may be installed for high current consumption utility/generator only operated loads.

#### Backup Circuit Planning

- Plan the location of the backup circuits, critical outlets might include: computers, televisions, lights, etc. Direct wiring can include ceiling lights and fans, etc. The loads for the circuits should be distributed so the individual circuit breakers and the Vesta Power Module are not overloaded. Consideration should also be given as to what circuits are considered critical to operate during an outage since battery run time is limited and load dependant (i.e., heavy current drawing loads, such as heaters, washers/dryers, etc. are not good choices for backup power as they will quickly drain the batteries or overload the system).

#### Wiring

- All wiring must conform to local and national codes, and meet the NEC. Wiring runs should be installed by a *qualified* electrician, experienced in installing backup/renewable energy systems.



**NOTE:** Before installing the PDC or PM/BE, read all instructions and cautionary markings located in this manual.

## 2.0 RI INSTALLATION

The PDC-RI is the basic model of the PDC. This product is intended to be installed in new building construction as a rough-in kit, supplying up to eight load circuits from 15 or 20 amp circuit breakers (installer supplied). These circuits can easily be converted to full automatic backup power with the addition of a Vesta RB (Relay Board) option and Vesta PM and BE modules without the need for extensive building rewiring. All PDC load circuits can be rewired for Vesta backup power within the PDC.

### Front Panel Cover Removal

- Remove the 6 screws from the front cover panel which secures it to the enclosure.
- Remove the front cover panel from the enclosure and set it aside.

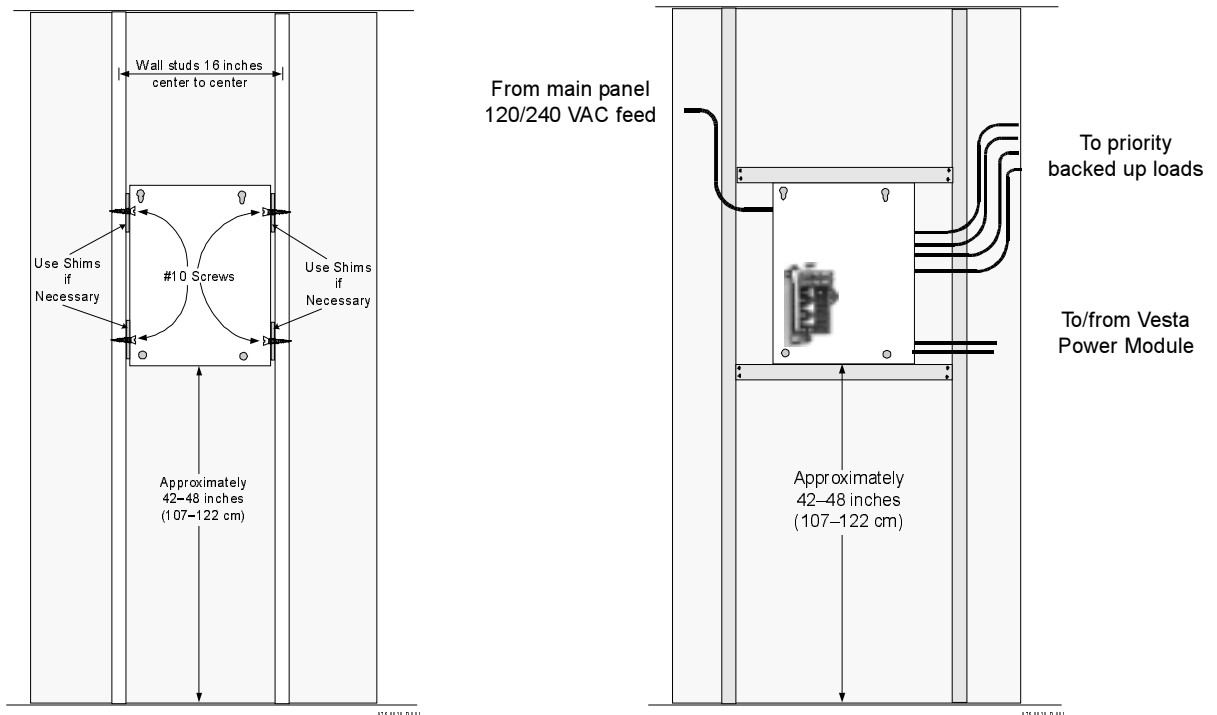


**Figure 2-1**  
**Front Cover Removal**

### Mounting

Before mounting the PDC:

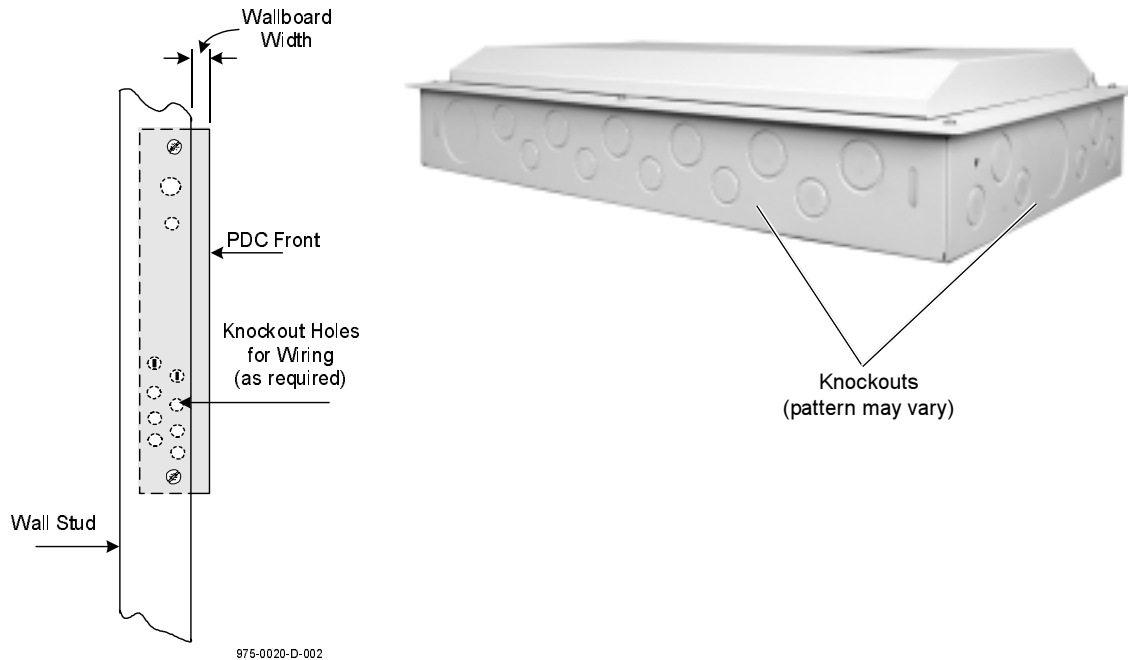
- Determine which of the knockouts will be used for the input/output cables and mark the location on the stud. Knockouts are available on the top, bottom and sides of the enclosure.
  - Mount the PDC box so it extends from the studs by the thickness of the wallboard for a flush fit when the front cover is installed.
1. Position the PDC approximately 42–48 inches (106–122 cm) from the floor for easy access and near the main electrical panel using the back or side panel mounting holes and #10 or larger screws (use shims if necessary).



**Figure 2-2**  
**PDC Mounting to Wall Studs**

## 2.0 RI INSTALLATION

### Mounting (continued)



**Figure 2-3**  
**Side View Mounting and Knockouts Detail**

### Backup Circuit Planning

Before wiring the PDC into the building wiring, determine the circuits most important to require backup power during a utility outage. These should then be arranged by priority so less important circuits can be switched off to conserve battery backup power to run the loads during extended utility outages.

Such circuits and priority might include:

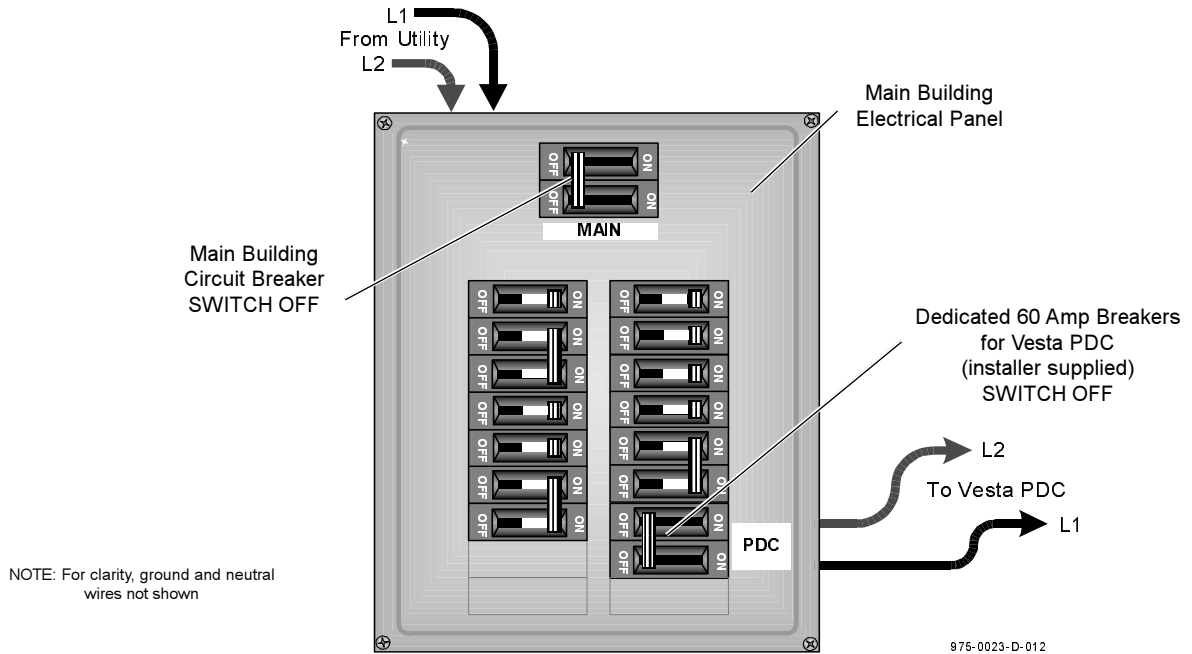
- 1 Home office equipment: phone, computer, fax machine
- 2 Television, stereo
- 3 Fluorescent lights-main floor, kitchen
- 4 Bathroom/bedroom lights
- 5 Microwave
- 6 Refrigerator
- 7 Furnace
- 8 Freezer

### Wiring (for RI rough-in installation)

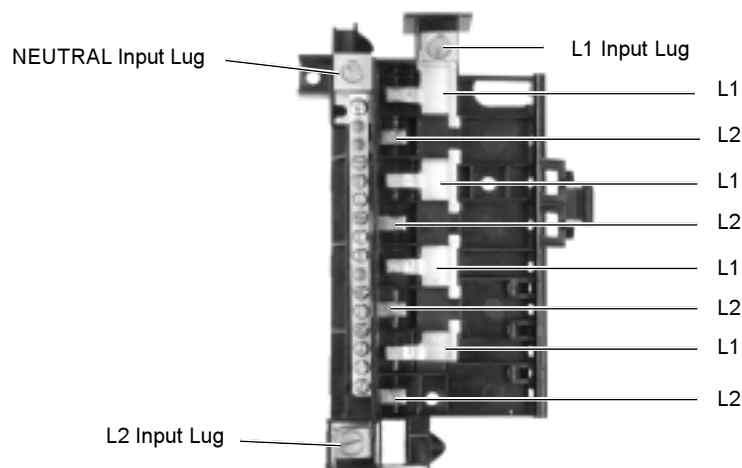


**WARNING: ENSURE THE MAIN BUILDING CIRCUIT BREAKER IS OFF BEFORE REMOVING THE MAIN ELECTRICAL PANEL COVER. USE EXTREME CAUTION WHEN WORKING IN THE MAIN PANEL. WIRING SHOULD BE PERFORMED BY A QUALIFIED ELECTRICIAN.**

1. Locate (or install) a 60 amp, 2-pole feed breaker in the main electrical panel. This breaker is dedicated to supplying power to the critical loads (distributed via the RI circuit breakers). Switch this main breaker OFF.




**Figure 2-4**  
**Switch OFF Main Building Breaker and PDC Feed Breaker**




**Figure 2-5**  
**RI Circuit Breaker Base**


## 2.0 RI INSTALLATION

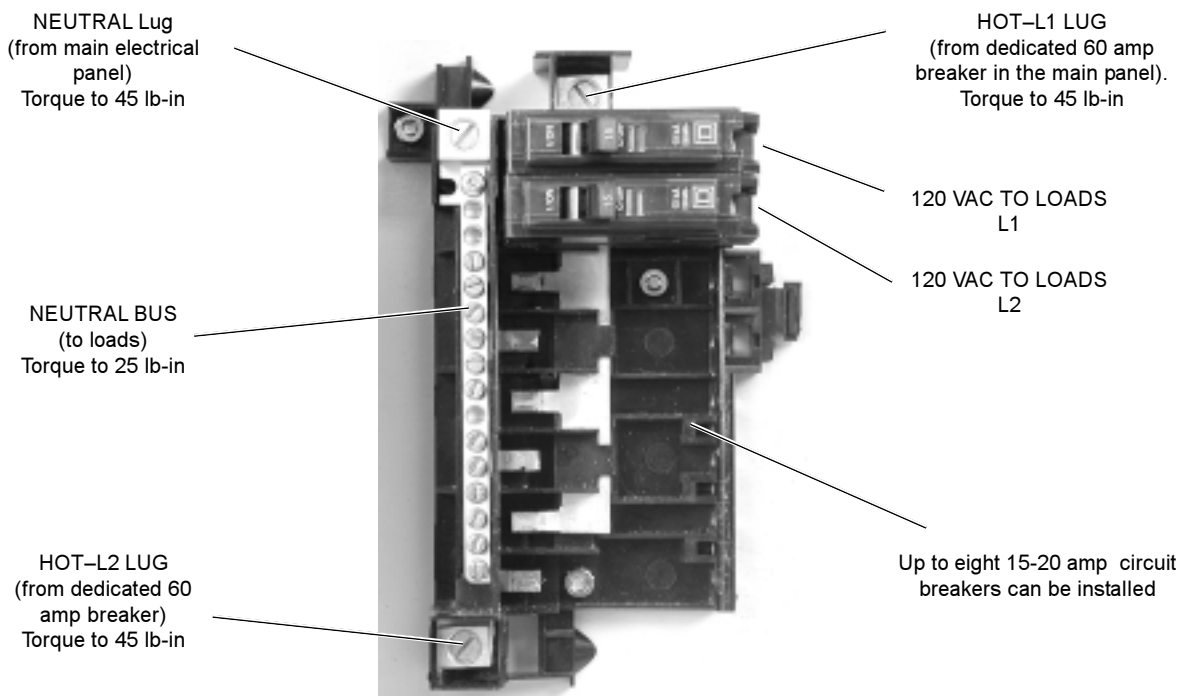
2. Run a #6 AWG, 3-conductor (6/3, three insulated wires plus ground) Loomex/Romex or armored wire from the dedicated 60 amp, 2-pole breaker in the main electrical panel to the PDC enclosure.
  - Connect the ground wire between the main electrical panel's ground bus and the GROUND bus in the PDC. Torque to 25 in/lb (2.8 N-m).
  - Connect the neutral wire between the main electrical panel's neutral bus and the *large* NEUTRAL lug in the PDC. Torque to 45 in/lb (5 N-m).
  - Connect the L1 HOT wire between the main electrical panel's dedicated 60 amp, L1 breaker terminal and the L1 lug in the PDC. Torque to 45 in/lb (5 N-m).
  - Connect the L2 HOT wire between the main electrical panel's dedicated 60 amp, L2 breaker terminal and the L2 lug in the PDC. Torque to 45 in/lb (5 N-m).
3. Install the desired number of Square D, model QO, plug-in, 15-20 amp circuit breakers (installer supplied) into the PDC load panel. The PDC accepts up to 8, single-pole circuit breakers. Two-pole circuit breakers can be installed for 120/240 VAC multibranch circuits (L1/L2) such as kitchen counter receptacles.

 **NOTE:** Most 240 VAC appliances consume too much battery power to be practical for backup purposes.

 **NOTE:** If the RB option is also installed at this time, skip to the RB section (Step 5.a) for details on load circuit breaker wiring.

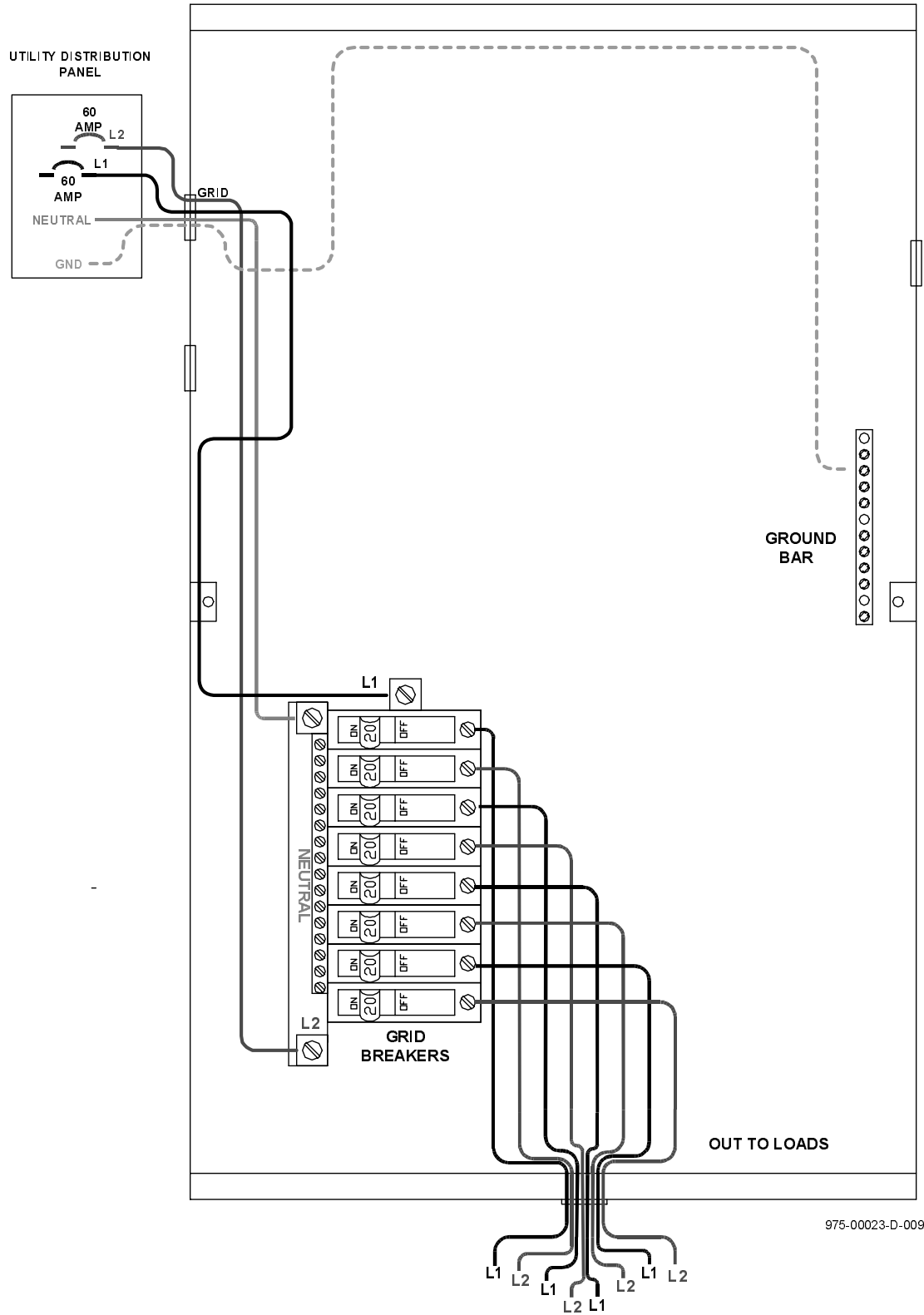
4. Run #14 AWG, 2-conductor (14/2, two insulated wires plus ground) from the individual 15 amp circuit breakers (12/2 for 20 amp circuit breakers) to the building's load circuits (i.e., AC power receptacles, lights, furnace, etc.). Allow enough extra wire length to reach the lower center area or the PDC (for future RB upgrade installation).

 **NOTE:** Torque all wires according to the circuit breaker's specifications.



**Figure 2-6**  
**Circuit Breaker Wiring**

## Wiring (continued)

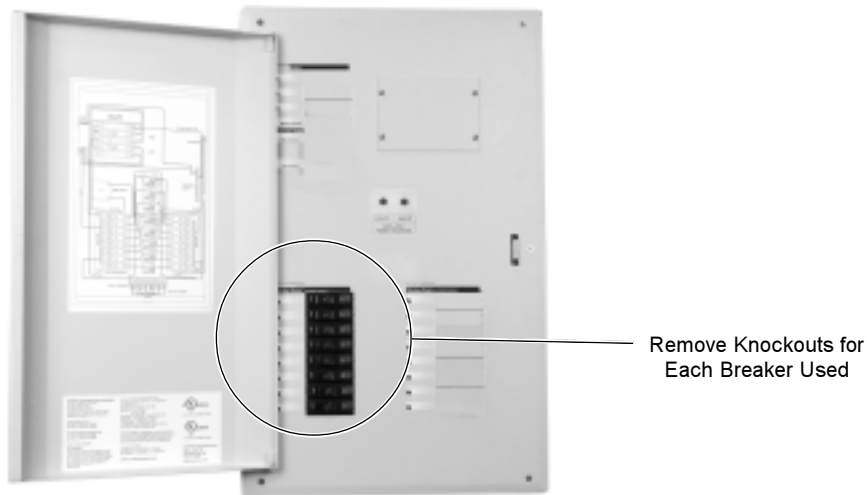


**Figure 2-7**  
**PDC-RI Wiring Diagram**

## 2.0 RI INSTALLATION

### Front Panel Cover Installation

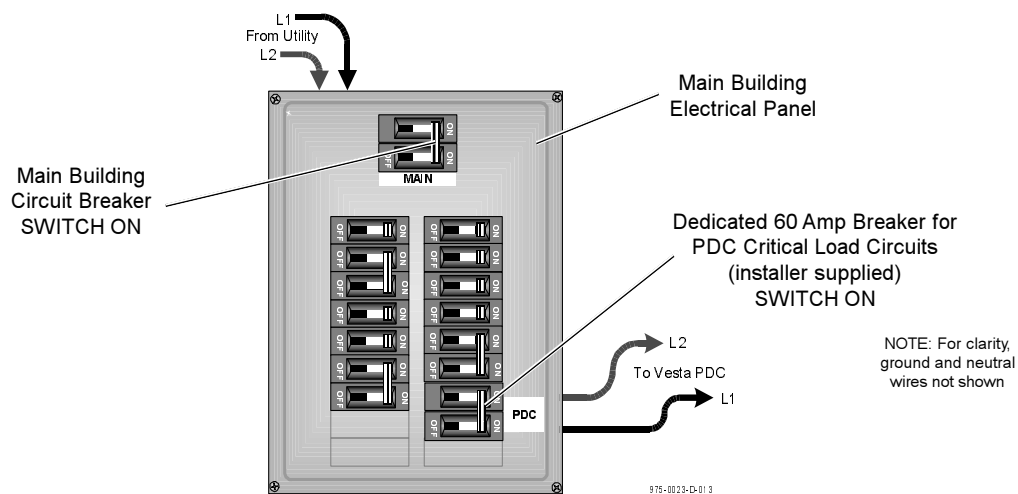
1. Twist out the corresponding breaker knock out plates from the PDC front cover.
2. Install the PDC front cover plate using the supplied 6, #8 x 32 cover screws.



**Figure 2-8**  
**RI with Circuit Breakers Installed**

### Test Installation

1. Switch the main building circuit breaker ON.
2. Switch the 60 amp feed breaker ON.
3. Switch each of the PDC load panel breakers ON and test the circuits using an AC voltmeter (DMM, multimeter, etc.) or 100 watt test lamp connected to the critical load circuit.



**Figure 2-9**  
**Switch ON Main Building Breaker and PDC Feed Breaker**

### 3.0 RB INSTALLATION

These instructions assume the PDC-RI (rough-in) has already been installed and is ready to be upgraded with the PDC-RB relay board transfer kit. Skip this section if the RB kit is not being installed at this time. The Vesta power module installation is covered in the Vesta PM installation manual.

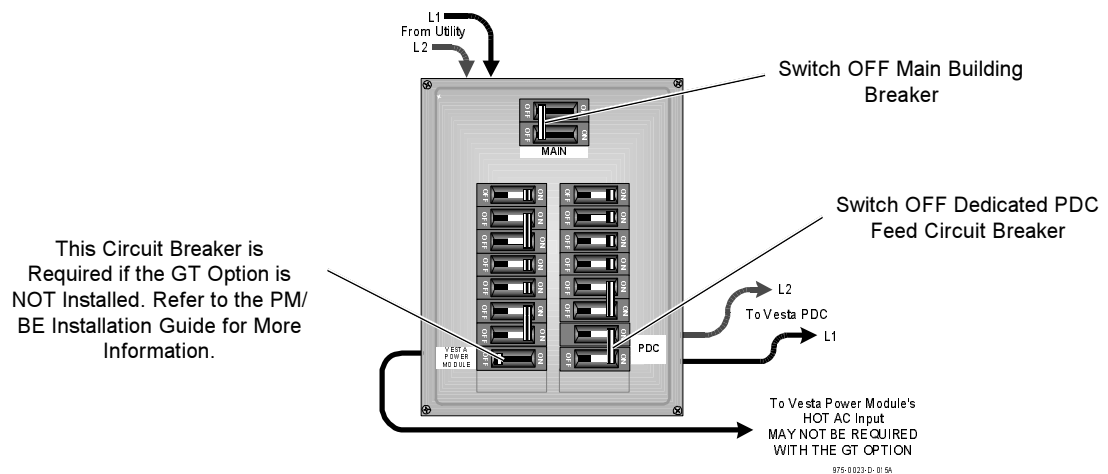


**WARNING: ENSURE THE MAIN BUILDING CIRCUIT BREAKER IS OFF BEFORE PERFORMING ANY REWIRING IN THE PDC ENCLOSURE. USE EXTREME CAUTION WHEN WORKING IN THE MAIN PANEL. WIRING SHOULD BE PERFORMED BY A QUALIFIED ELECTRICIAN.**

The PDC-RB option adds automatic transfer to backup power during a utility outage to the basic PDC-RI enclosure.

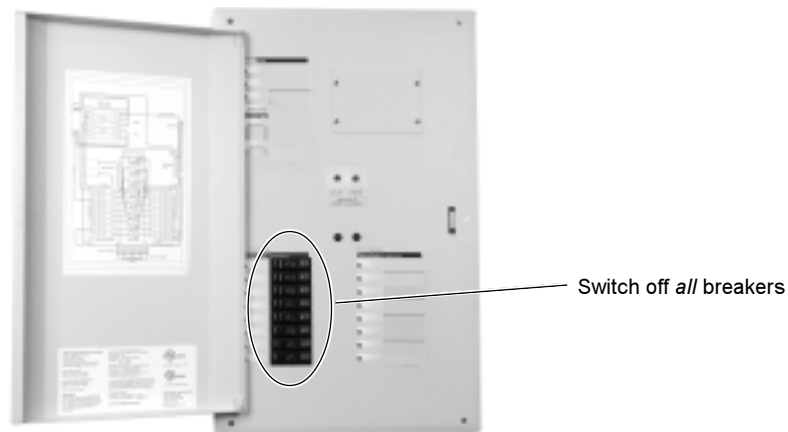
#### Switch Power OFF

1. Locate the dedicated 60 amp 2-pole feed breaker (installer supplied) in the main electrical panel and switch it OFF. This breaker is dedicated to supplying power to the critical loads in the backup power system when utility power is available.



**Figure 3-1**  
**Switch Dedicated and Main Building Breaker OFF**

2. Switch OFF the "Square D QO" plug-in breakers (there may be up to eight single-pole 15-20 amp breakers installed) in the PDC panel.



**Figure 3-2**  
**Switch all 15 amp Breakers OFF**

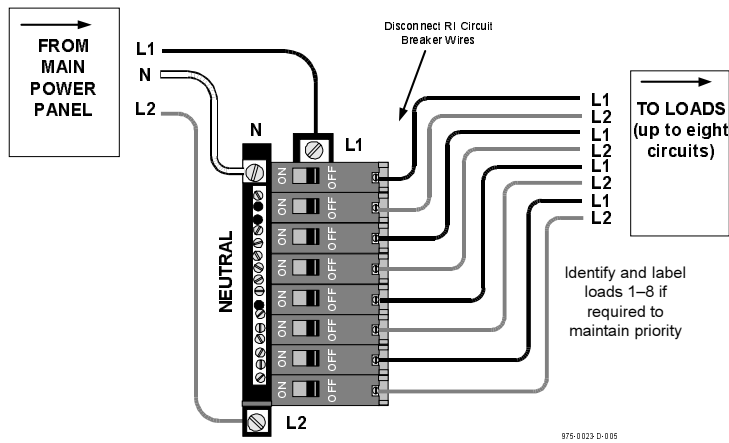
### 3.0 RB INSTALLATION

3. Remove the 6 screws from the front cover panel which secures it to the enclosure. Remove the front cover panel from the enclosure and set it aside.




**Figure 3-3**  
**Front Cover Removal**

4. Remove the LOAD circuit wires from each of the installed load panel breakers. Bend the wires aside to allow mounting of the (RB) relay board.

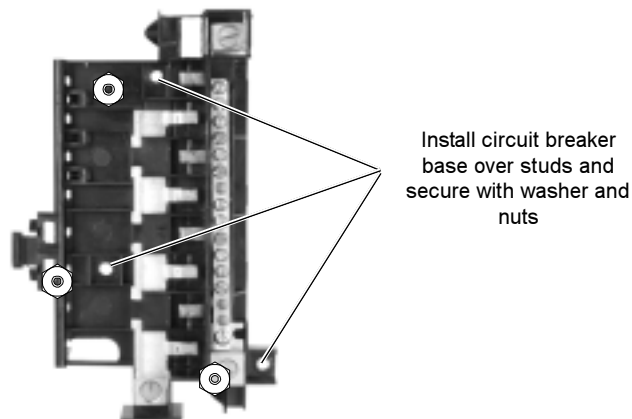


**Figure 3-4**  
**PDC-RI Original Wiring**

 **NOTE:** For clarity, ground (utility/inverter/load) and neutral (load) wires are not shown in these diagrams.

### 3.0 RB INSTALLATION

- 5.a** Install the “inverter load control” circuit breaker base over the threaded studs and install a washer and nut (included). Torque the nut to 25–30 lb-in (2.4–3.4 N-m), see Figure 3-5 for mounting holes and Figure 3-6 for mounting location in the PDC.



**Figure 3-5**  
**PDC-RB Circuit Breaker Base Installation**

- 5.b** Install the Relay Board assembly by placing one nylon standoff onto each threaded stud. Fit the relay board assembly onto the studs and on top of the standoffs. Install a hex nut and washer to the all *but the top two studs*. Torque the nuts to 25–30 lb-in (2.4–3.4 N-m), see Figure 3-6 and 3-7.
- 5.c** Place a nylon washer (supplied) over each of the two studs and Install the LED bracket by aligning up the two holes in the base of the bracket with the threaded studs protruding through the relay board. Secure with the nuts supplied.
- 5.d** Wire the LEDs as show in the illustration below.
- 5.e** Install the Time Delay circuit in the PDC. See Figure 3-6 and 3-8.



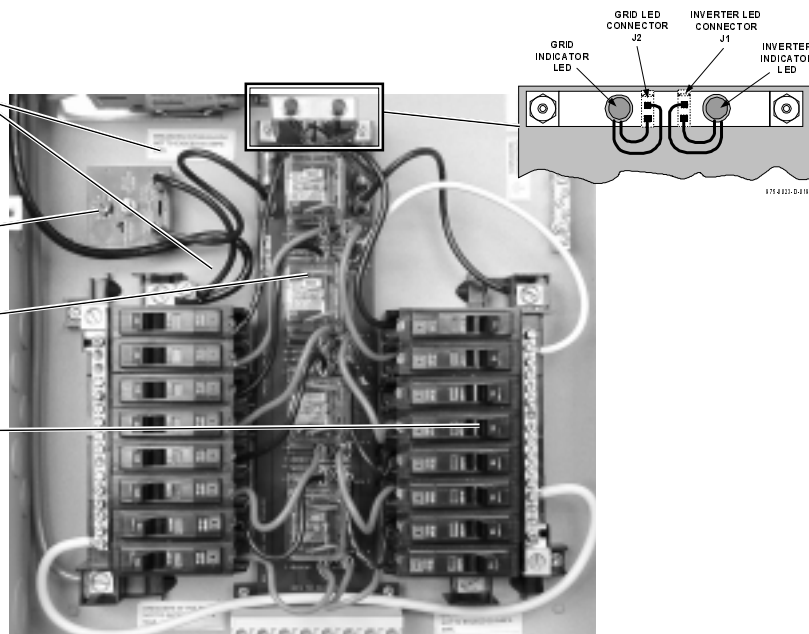
**NOTE:** If installing the GT option *at this time*, do *not* connect the GRID wire to the L1 terminal. Leave it loose and connect it as shown in the GT installation section of this manual.

Do *NOT* install this wire if the GT option is also being installed. Refer to the GT installation section of this manual

Install Delay Timer

Install Relay Board

Install RB Breaker Base (circuit breakers are installer supplied)



**Figure 3-6**  
**PDC-RB Relay Board Installation**

3.0 RB INSTALLATION

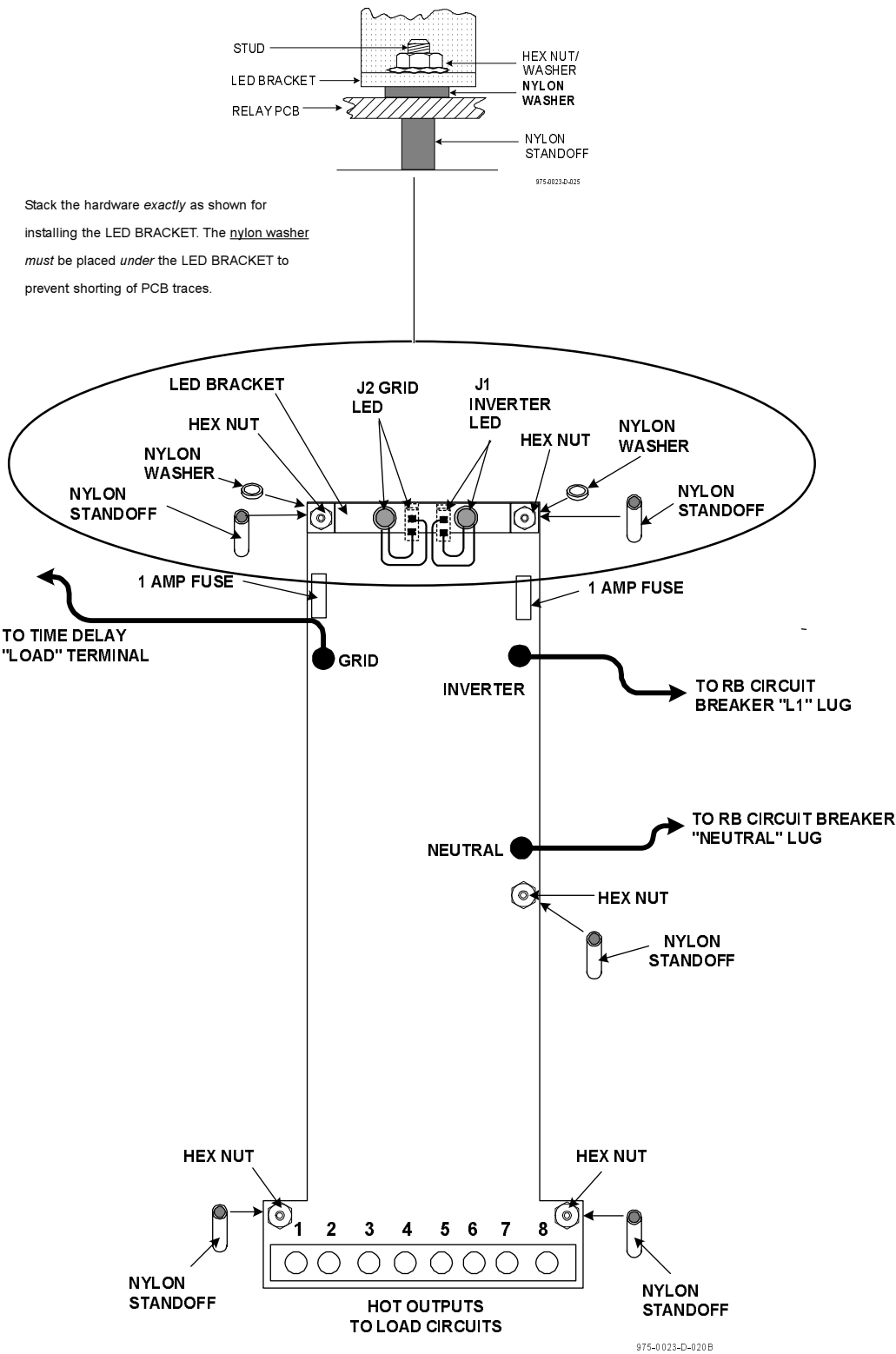


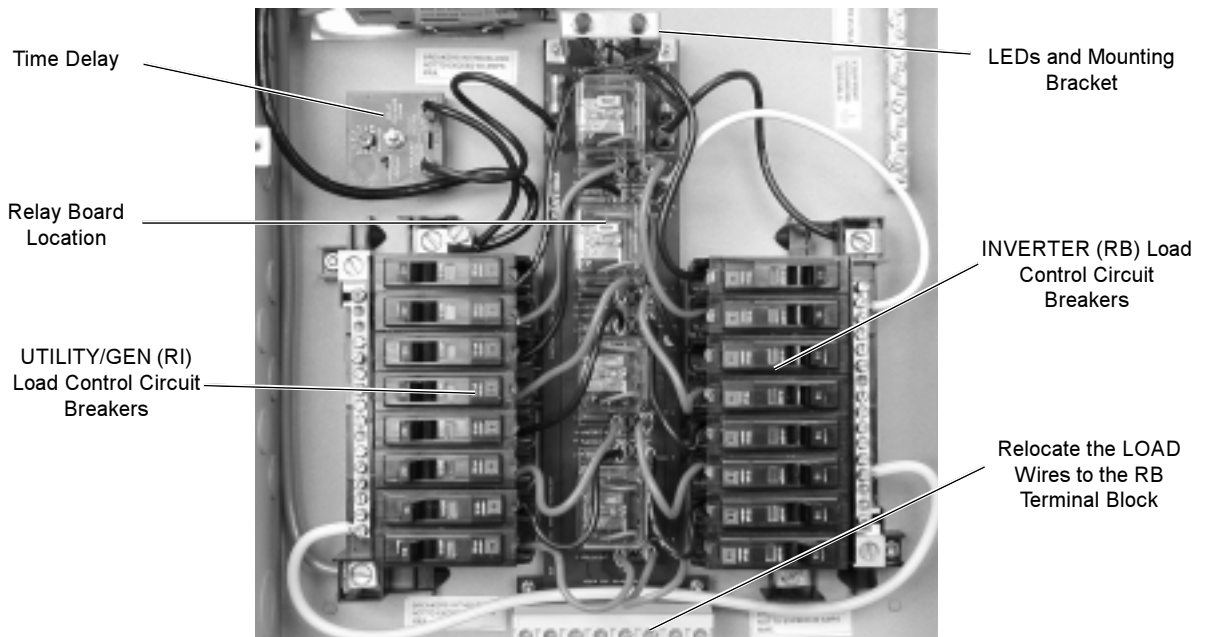
Figure 3-7  
PDC-Relay Board Installation Detail

### 3.0 RB INSTALLATION



**Figure 3-8**  
**PDC-RB Time Delay Installation**

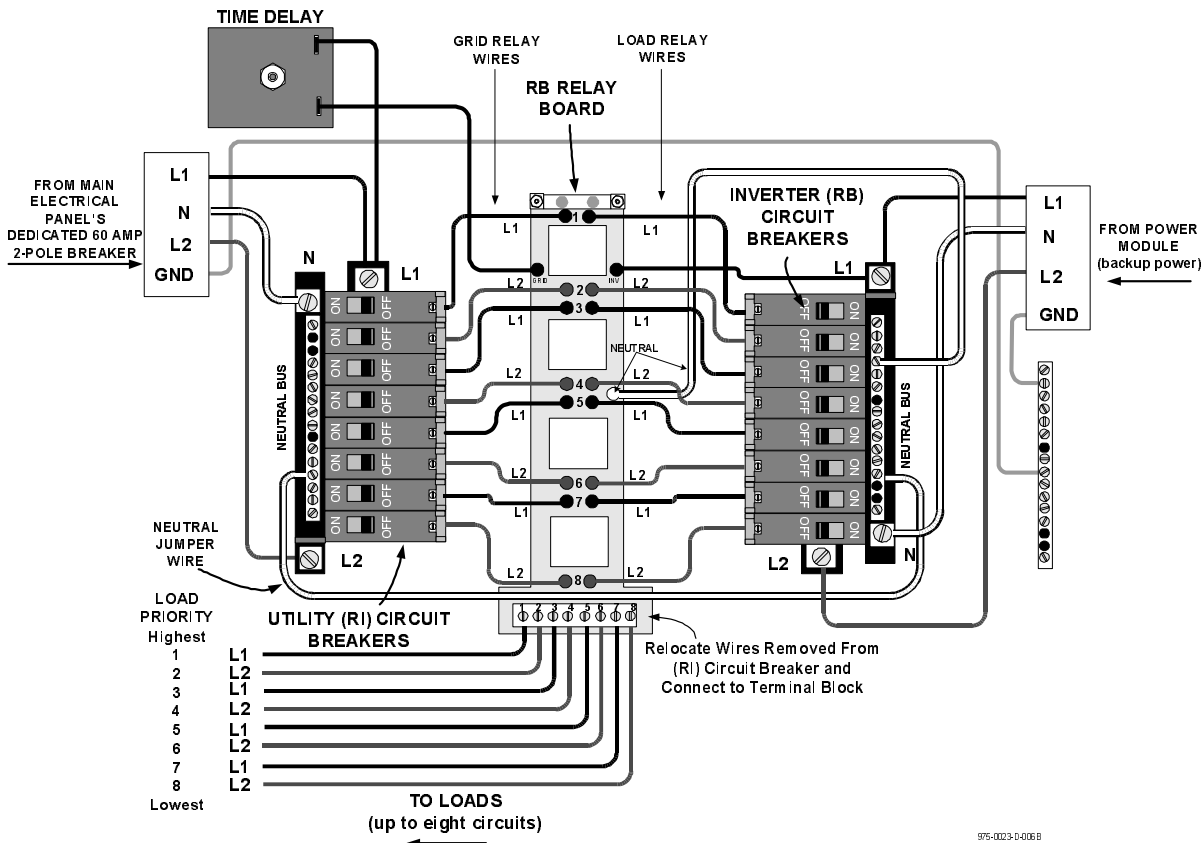
6. Reconnect the LOAD circuit wires (removed in Step 4) to the relay board terminal block labeled "LOAD" in the same priority order (1–8). The terminal block is located on the lower section of the relay board. Torque the load wires in the terminal strip to 25 lb-in (2.8 N-m).
7. Connect a pair of relay wires between the UTILITY (RI) and INVERTER/GEN (RB) circuit breakers. The left-hand relay wires connect to the UTILITY (RI) circuit breakers. The right-hand relay wires connect to the INVERTER/GEN (RB) circuit breakers. The black wires indicate the L1 leg, and the red wires indicate the L2 leg. Refer to Figure 3-9 and 3-10.



**Figure 3-9**  
**PDC-RB Installation and Wiring**

### 3.0 RB INSTALLATION

8. Switch the INVERTER load control breakers to OFF.
9. Run 10/3 (# 10 AWG, three insulated wires plus ground) Loomex/Romex or armored cable from the Vesta Power Module's 120/240 AC OUTPUT, NEUTRAL and GROUND terminals to the PDC.
  - Connect the ground wire, to the PDC's GROUND bus. Torque to 25 lb-in (2.8 N-m).
  - Connect the neutral wire to the PDC's NEUTRAL bus. Torque to 25 lb-in (2.8 N-m).
  - Connect the Power Module's HOT L1 wire to the L1 terminal on the PDC's INVERTER load control breaker assembly.
  - Connect the Power Module's HOT L2 wire to the L2 terminal on the PDC's INVERTER load control breaker assembly. Torque to 45 lb-in (5 N-m).
10. Install a white #6 AWG wire from the NEUTRAL lug of the UTIL load control breaker to the NEUTRAL lug on the INVERTER/GEN (RI) load control breaker assembly. Torque to 45 lb-in (5 N-m).
11. Check all wiring against the instructions and the wiring diagram.



**Figure 3-10**  
**PDC-RB Wiring Diagram**

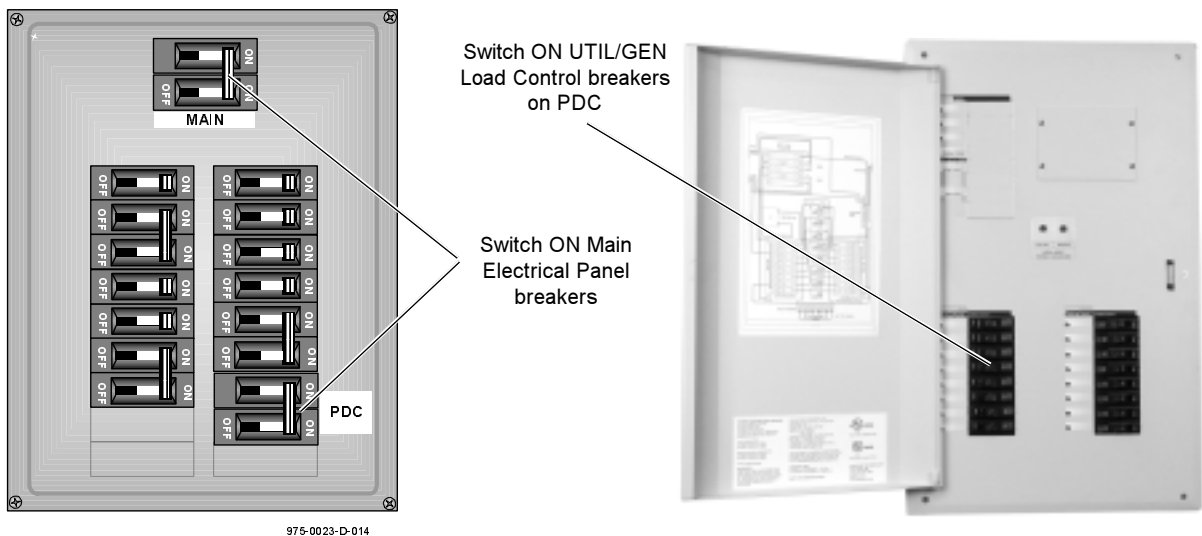
### 3.0 RB INSTALLATION

12. Twist out the corresponding inverter load control breaker knockout plates from the PDC's front cover for all *installed* breakers.
13. Reinstall the PDC's front cover panel using the six screws removed in Step 3.
14. Install the Vesta backup circuit breaker label on the PDC's front cover.
15. Switch ON the dedicated 60 amp breaker in the main electrical panel.
  - Switch the main utility building breaker ON.
  - Switch each of the UTIL/GEN (RI) load control breakers ON.

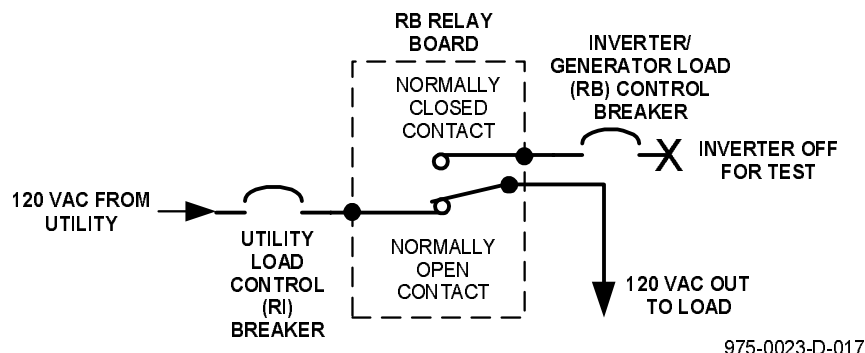


**NOTE:** DO NOT switch ON the Vesta Power Module's AC input breaker at this time. The following test verifies that utility power is supplied to the circuits connected to the PDC.

16. Test the circuits using a true rms AC voltmeter. There should be utility grid AC power on each of the circuits. The utility power available indicator light should be ON.




**Figure 3-11**  
**Utility Operation**

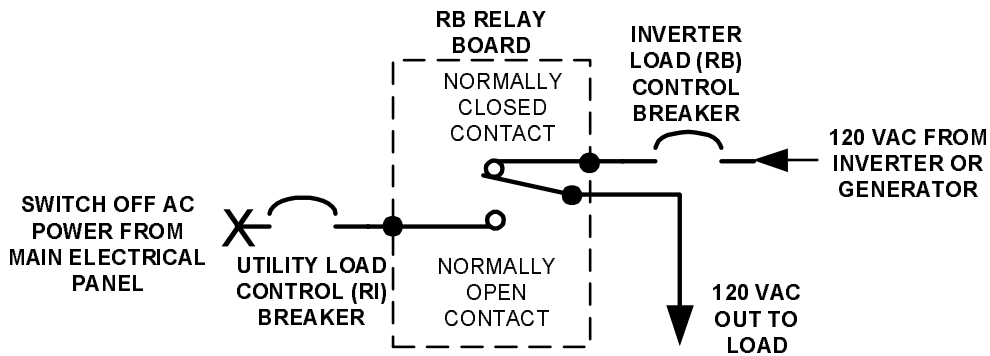


**Figure 3-12**  
**Apply Utility Power to PDC**

### 3.0 RB INSTALLATION

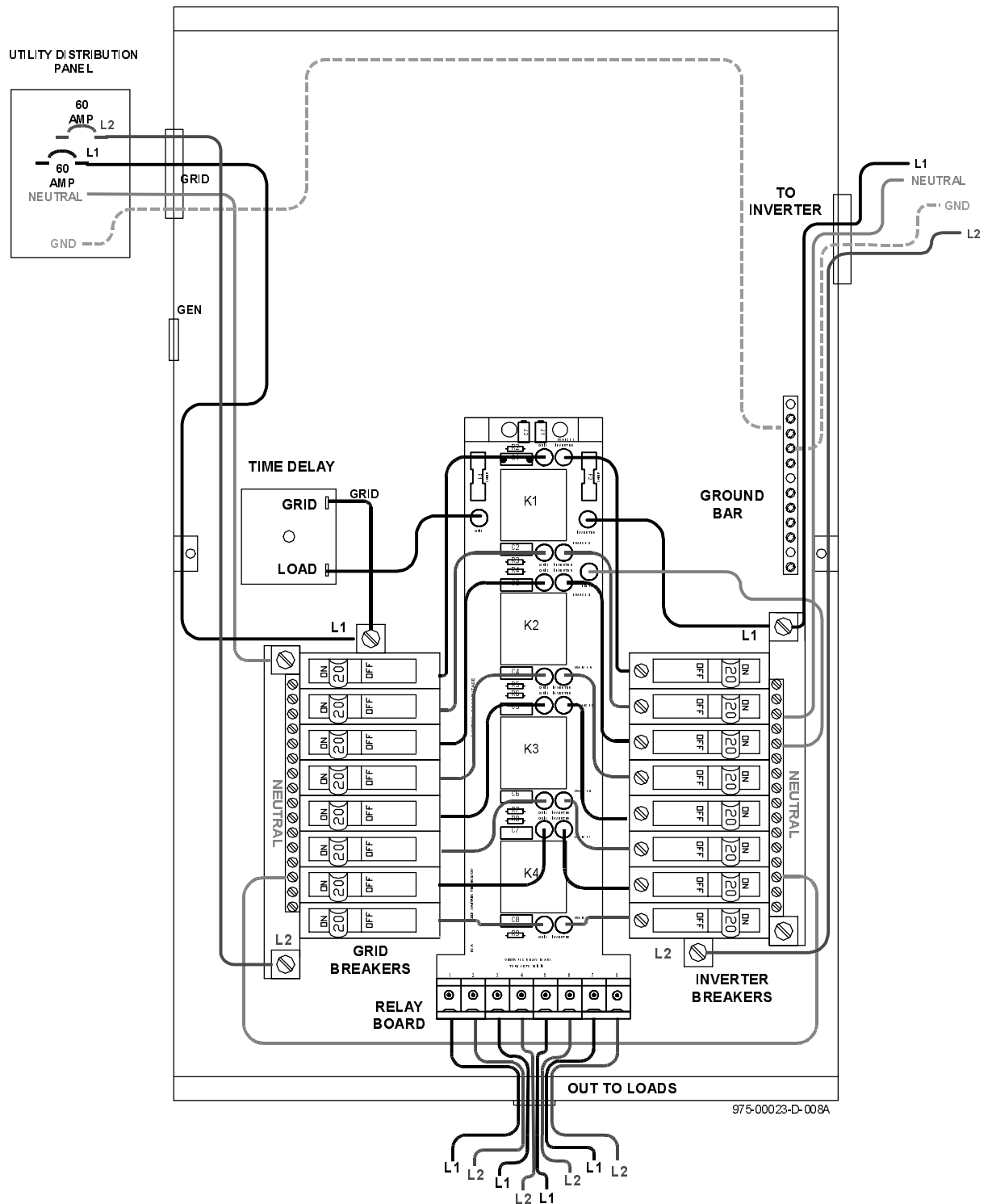
 **NOTE:** The UTIL/GEN LOAD CONTROL breakers switch OFF/ON the loads while in utility or generator operation. The INVERTER LOAD CONTROL breakers switch OFF/ON the loads while in the inverter mode (i.e., running from the Vesta PM batteries). The INVERTER LOAD CONTROL breakers can be used for load shedding, allowing higher priority loads to run longer in the backup mode.

16. Switch ON the PDC INVERTER load control circuit breakers.
17. Switch the Vesta Power Module's main supply breaker(s) to ON (refer to the Vesta Power Module manual).
18. Switch the Vesta power module AC output breaker ON. The inverter power available light should be ON.
19. Test the PDC's automatic transfer operation by switching OFF the 60 amp PDC feed breaker (in the main electrical box). The PDC relay board should automatically transfer the load to Vesta supplied power. Verify AC power is being supplied to the receptacles using a test load or true rms AC voltmeter.



975-0023-D-018

**Figure 3-13**  
**Inverter Operation**



**Figure 3-14**  
**PDC RI Option Wiring Diagram**

## 4.0 GT INSTALLATION

The PDC-GT Generator Transfer panel kit is an upgrade to the Vesta PDC-RI + RB. The GT option provides a convenient means to manually switch from utility grid to generator power. In the event of an extended outage, a manually started generator can be easily connected to the system from outside the building using the 30 amp, 120/240 VAC generator inlet.



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



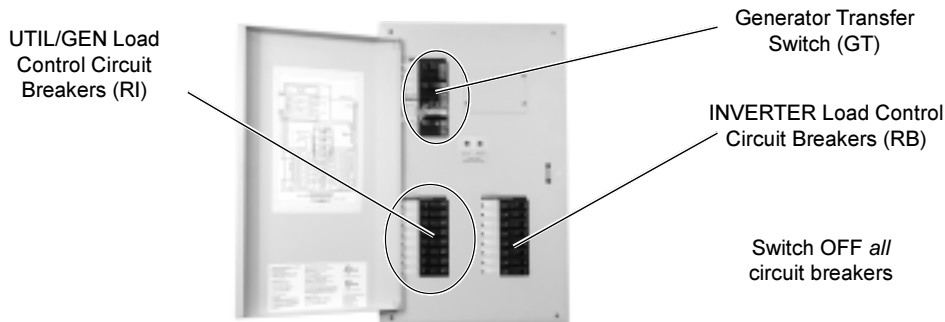
**NOTE:** These instructions assume the PDC-RI (rough-in), and RB option have already been installed and the PDC is ready to be upgraded with the PDC-GT Generator Transfer kit. If the Generator Transfer kit is not being installed skip this section.

### Switch Power OFF

1. Locate the 60 amp, 2-pole feed breaker in the main electrical panel and switch it OFF. This breaker is dedicated to supplying power to the critical loads in the backup power system when utility power is available.
2. Switch OFF the Vesta Power Module's AC OUT breaker to remove Vesta supplied power to the PDC enclosure.
3. Switch OFF the UTIL and INVERTER/GEN load control breakers in the PDC (there may be up to 16, single-pole, 15-20 amp breakers installed).



**WARNING: VERIFY THE GENERATOR DOES NOT HAVE NEUTRAL/GROUND BOND. IF A NEUTRAL/GROUND BOND EXISTS, IT *MUST* BE *DISABLED* BEFORE WIRING IT INTO THE VESTA POWER SYSTEM.**



**Figure 4-1**  
**Switch all 15 amp Breakers OFF**

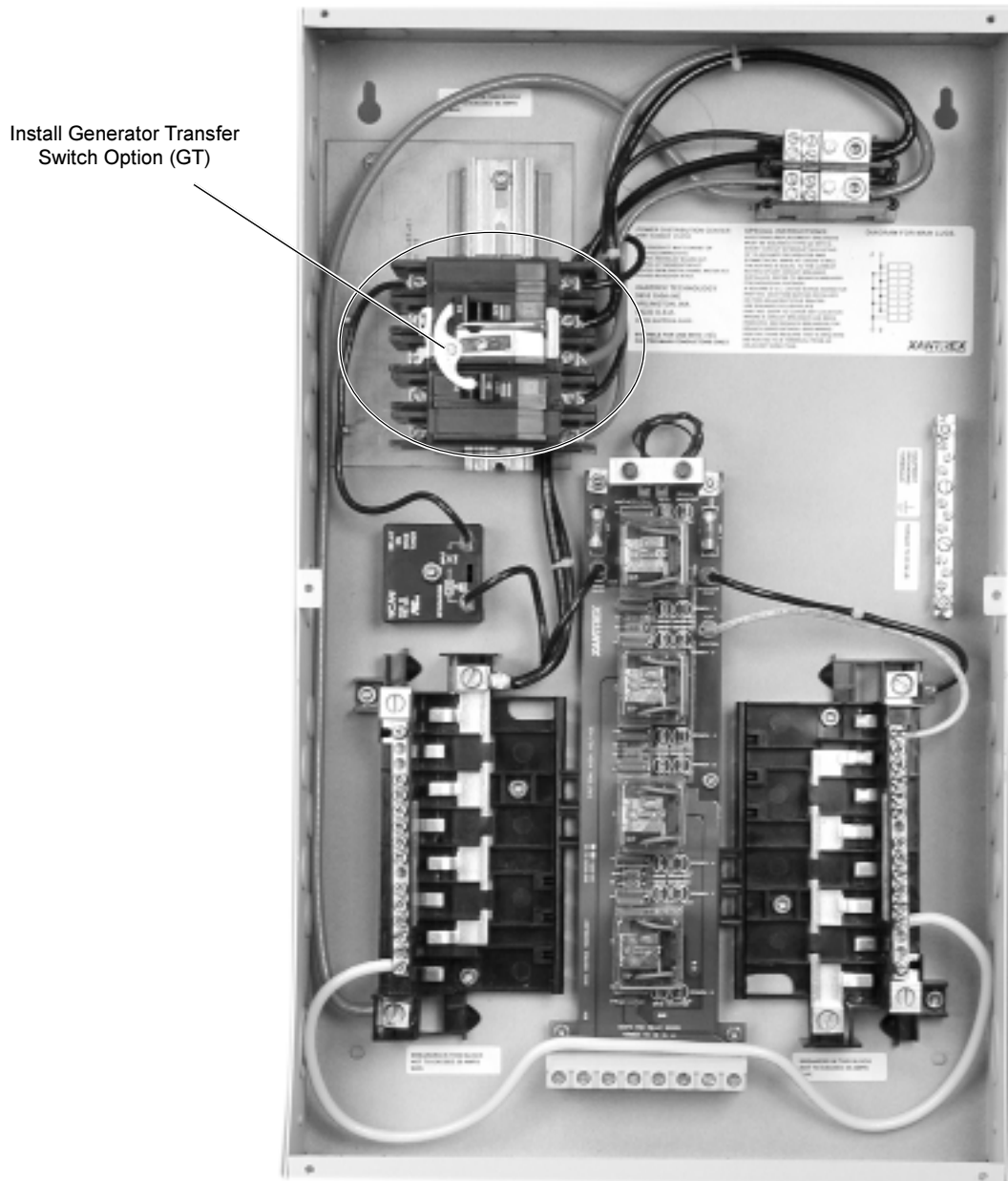
4. Remove the six screws from the front cover panel which secures it to the enclosure. Remove the front cover panel from the enclosure and set it aside.



**Figure 4-2**  
**Front Cover Removal**


## 4.0 GT INSTALLATION

5. Install the Generator Transfer panel DIN rail assembly and the Power Distribution Terminal Block using the hardware provided. Refer to Figure 4-3 for location of components.
6. Install the rail mount breakers onto the DIN rail mount (one dual-pole breakers plus a three-pole breaker).

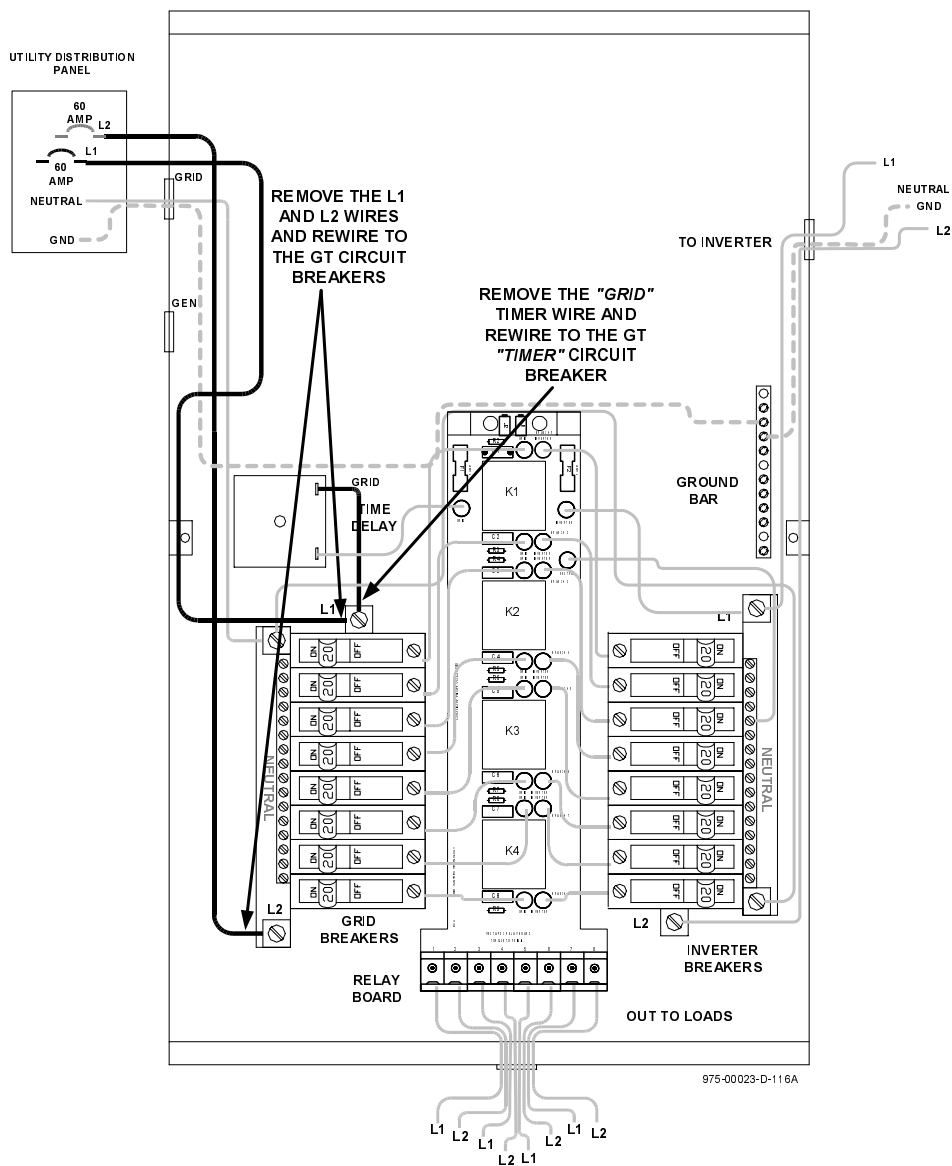


**Figure 4-3**  
**GT Installation in PDC**

## 4.0 GT INSTALLATION

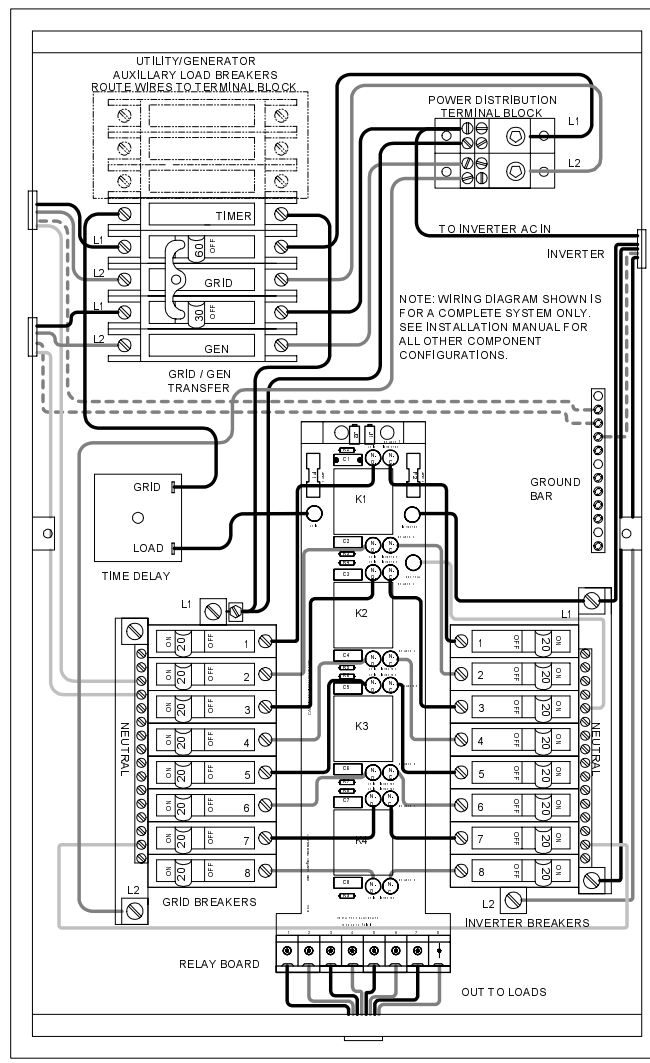
 **NOTE:** The GT option provides an auxiliary 30 amp breaker to supply the Vesta Power Module and battery charger.

7. Install the generator/utility interlock device as shown in the Square D installation sheet.
8. Remove the utility L1, L2 and “GRID” wires from the UTIL load control (RI) circuit breaker’s L1 and L2 terminals (see Figure 4-4). Reinstall them into the Generator Transfer assembly breakers as shown in Figure 4-5.
  - Connect the utility HOT L1 wire (removed from the UTIL RI’s L1 lug) to the GT breaker terminal labeled L1. See Figure 4-5.
  - Connect the utility HOT L2 wire (removed from the UTIL RI’s L2 lug) to the GT breaker terminal labeled L2. See Figure 4-5.
  - Connect the “GRID” (wire from the time delay) to the “TIMER” circuit breaker. See Figure 4-5.



**Figure 4-4**  
**Rewiring the PDC for the GT Option**

9. Run #6 AWG wires from the GT circuit breakers and terminal block as shown in Figure 4-5 (highlighted wires).
  - Run a #6 AWG wire between the GRID L1 circuit breaker and the L1 terminal of the power distribution terminal block.
  - Run a #6 AWG wire between the GEN L1 circuit breaker and the L1 terminal of the power distribution terminal block.
  - If the inverter charger's AC input has not previously been wired to the utility, wire it according to the diagram below. This configuration allows the batteries to charge from either utility or generator. Run a #6 AWG wire between the L1 terminal of the power distribution terminal block and the inverter's AC IN terminal.
  - Run a #6 AWG wire between the "TIMER" circuit breaker and the L1 terminal of the RI circuit breaker.
  - Run a #6 AWG wire between the L1 terminal of the power distribution terminal block and the L1 Terminal of the RI circuit breaker.



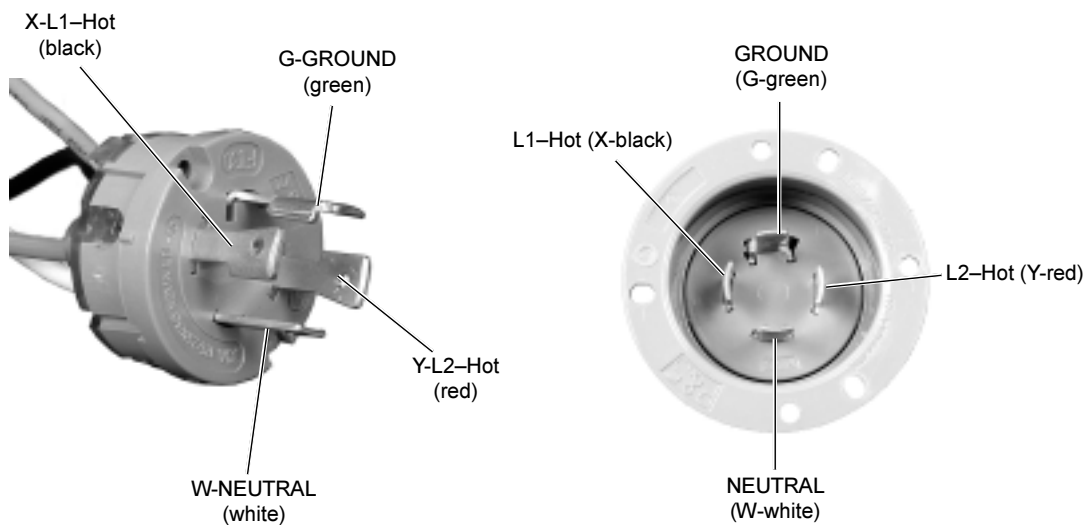
**Figure 4-5**  
**Utility Rewiring for GT Option**

## 4.0 GT INSTALLATION

10. Mount an approved generator inlet enclosure (installer supplied) on an outside building wall near the generator location. Secure it to the wall as described in the manufacturer's instructions.
11. Run a 10/3 (#10 AWG, 3 insulated conductors plus ground) Loomex/Romex or armored wire from the 30 amp, 2-pole, reverse fed breaker on the generator transfer panel out of the PDC and over to the remote generator inlet box and connect them to the generator inlet receptacle.
12. Recheck the wiring against the instructions and schematics.



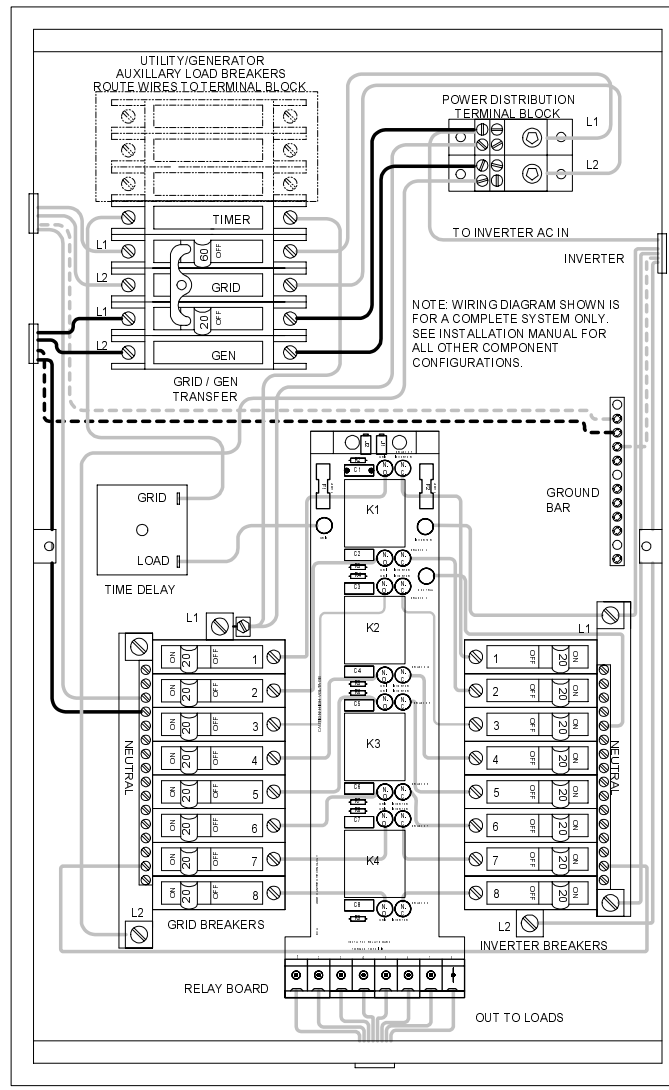
**Figure 4-6**  
**GT Generator Inlet Connector and Weather Proof Cover**



**Figure 4-7**  
**GT Generator Inlet Connector (angle and front view—NEMA L14-30)**

13. Route the (10/3 AWG) wires from the generator inlet receptacle to the PDC as follows:

- Connect the ground wire from the generator to the PDC's GROUND bus.
- Connect the neutral wire from the generator to the PDC's NEUTRAL bus (on the GT circuit breaker).
- Connect the generator's L1 HOT wire to the GEN terminal labeled L1 on the GT circuit breaker.
- Connect a #10 AWG wire between the GEN L1 circuit breaker and the L1 terminal of the Power Distribution Terminal Block.
- Connect the generator's L2 HOT wire to the GEN terminal labeled L2 on the GT circuit breaker.
- Connect a #10 AWG wire between the GEN L2 circuit breaker and the L2 terminal of the Power Distribution Terminal Block.
- Torque all wires to the circuit breaker manufacturer's specifications.



**Figure 4-8**  
**GT Option Wiring Diagram**

## 4.0 GT INSTALLATION

### UTIL/GEN Circuit Breaker Installation

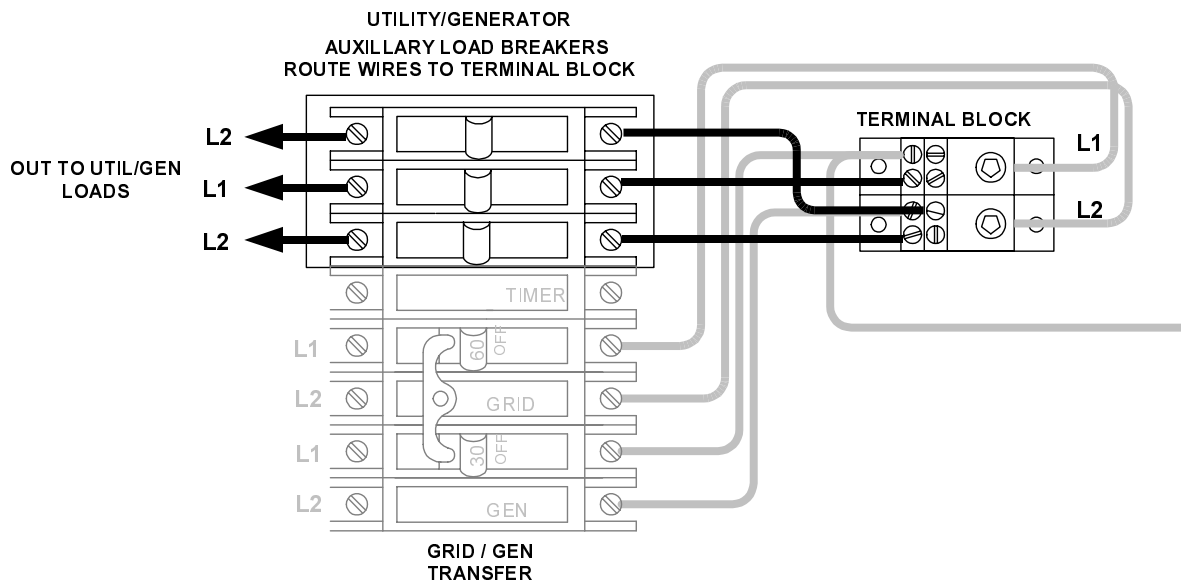
NOTE: If the Auxiliary UTIL/GEN circuit breakers are not being installed at this time, skip this section and proceed to Step 15.

14. The Generator Transfer panel can also accommodate up to three auxiliary (installer supplied) UTIL/GEN backup circuit breakers. These auxiliary circuits can be used to operate high power loads which are not suitable for the Vesta battery operated Power Module, such as an electric water heater, a high duty-cycle pump, electric floor heating, etc. These auxiliary generator supplied backup loads can be manually transferred to generator power, during a utility power outage.

- Install up to three (installer supplied) Square D QOU, 15–30 amp, DIN rail-mounted, single pole (or 2-pole equivalent) circuit breakers into the DIN rail.
- Connect a #10 AWG wire from an unused L1 or L2 terminal on the power distribution terminal block to one of the auxiliary circuit breakers (see Figure 4-10 as an example).
- Repeat the above step for any additional circuit breakers.

NOTE: The auxiliary loads will be fed from the utility supply when the Generator Transfer panel is in the “UTILITY” position.

NOTE: When connecting loads to a generator attempt to split the current so the L1 and L2 outputs are matched as closely as possible. Take into account the load current provided to the inverter for battery charging and current to the eight backed up circuits.



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**Figure 4-10**  
**Auxiliary UTIL/GEN Circuit Breaker Wiring**  
**(example only)**

15. Twist out the corresponding Generator Transfer panel breaker handle knockout plates in the PDC front cover.
16. Reinstall the PDC front cover panel using the six screws removed in Step 4.
17. Install the Generator Transfer panel label on the PDC front cover (if not already installed).
18. Switch the main building circuit breaker ON.
  - Switch the main 60 amp dedicated 2-pole circuit breaker ON.
  - Switch the GT'S GENERATOR TRANSFER switch to the "UTILITY" position.
  - Switch each of the auxiliary generator-only load breakers ON and test the circuits using a voltmeter or test load. It may take up to five minutes to return to utility power while the inverter and line are being synchronized. There should be AC voltage on each of the Vesta backed up circuits being fed from the utility power.
19. Verify the Vesta's PM battery charger is receiving power and charging the batteries.
20. Switch the Vesta PM module's AC OUTPUT breaker ON.
21. Switch ON the PDC inverter load control breakers.



**NOTE:** The next step requires a generator to be connected to the GT inlet receptacle, running and stabilized.

22. Test the PDC Generator Transfer panel by starting the generator and switching the transfer switch to the "GENERATOR" position. The generator should now be powering all of the (1-3 maximum) auxiliary UTIL/GEN circuits (if wired and circuit breakers installed) and the 1-8 INVERTER/GEN load circuits. Verify the AC output voltage is present using a true rms AC voltmeter or test load.
  - Verify the INV/GEN AVAILABLE SOURCE indicator light is ON.
23. Switch the Generator Transfer to the "UTILITY" position for normal power operation.
  - Verify the auxiliary GEN/AUX loads are still receiving power.



**NOTE:** There is a five minute delay before the 1-8 loads are powered from the utility. The auxiliary UTIL/GEN loads should switch over to grid immediately.

4.0 GT INSTALLATION

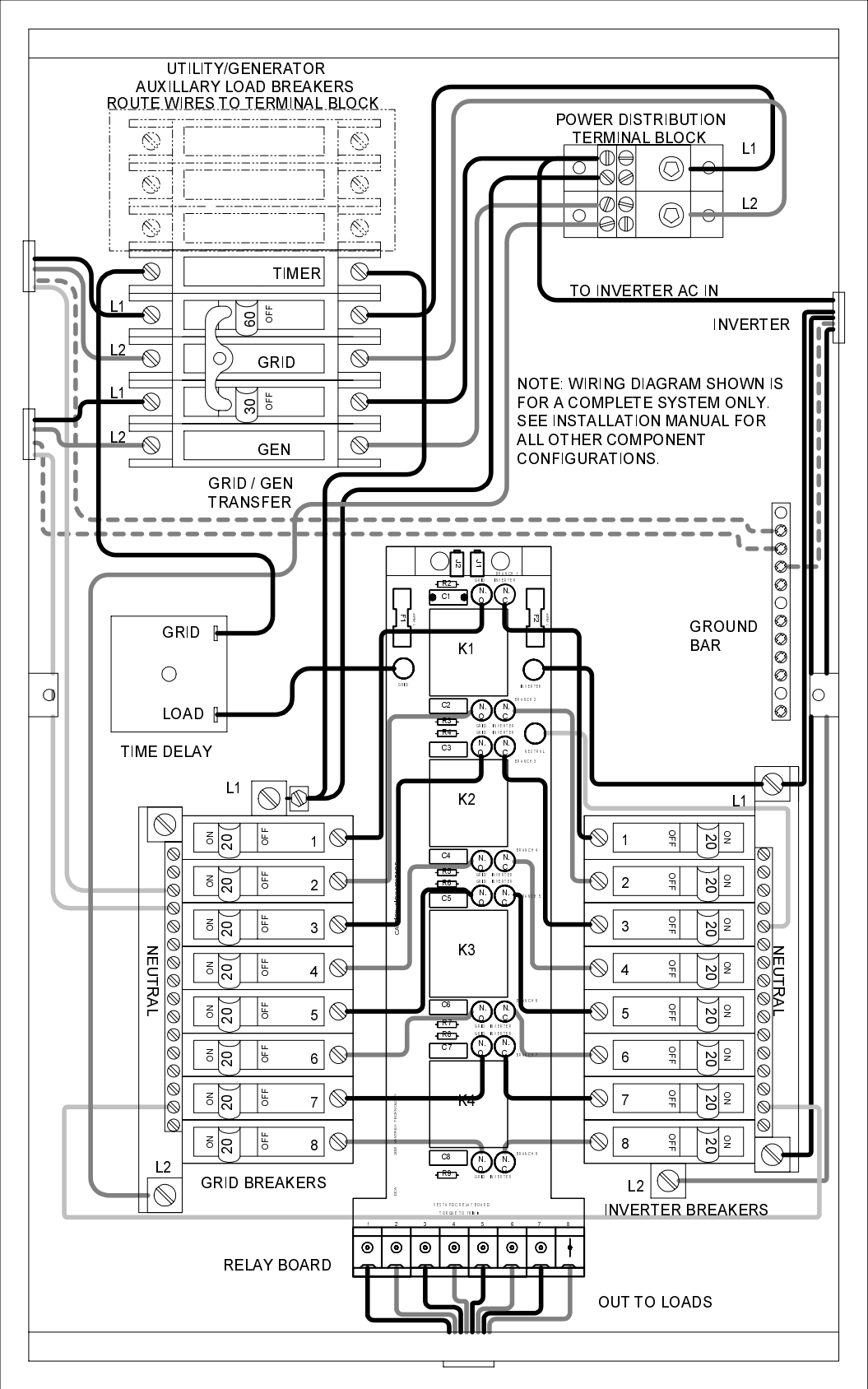


Figure 4-9  
Complete PDC Wiring Diagram

## 5.0 VO-DPM INSTALLATION

The VO-DPM Digital Power Meter kit adds a digital display showing the percent of power remaining based on precise battery capacity monitoring.



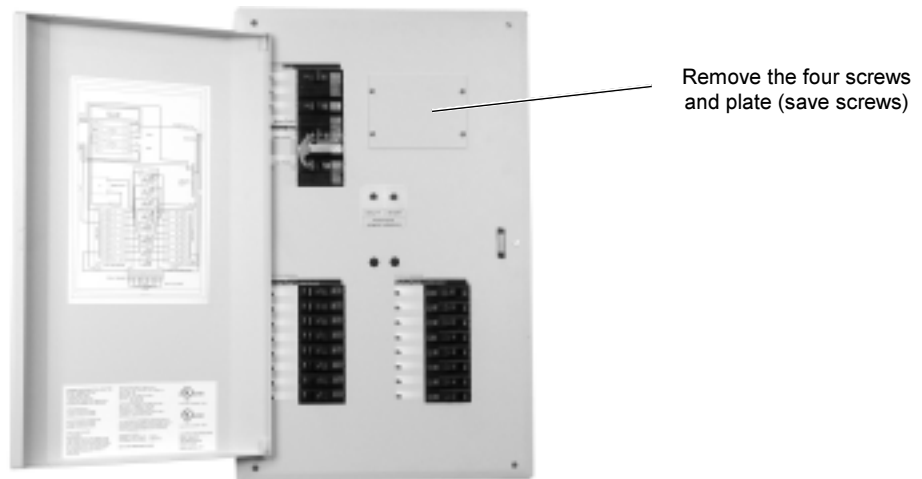
**WARNING: ENSURE THE MAIN BUILDING CIRCUIT BREAKER IS OFF BEFORE PERFORMING ANY REWIRING IN THE PDC ENCLOSURE. USE EXTREME CAUTION WHEN WORKING IN THE MAIN PANEL. WIRING SHOULD BE PERFORMED BY A QUALIFIED ELECTRICIAN.**



**WARNING: SWITCH THE VESTA DC DISCONNECT BREAKER OFF BEFORE REMOVING THE PDC PANEL.**

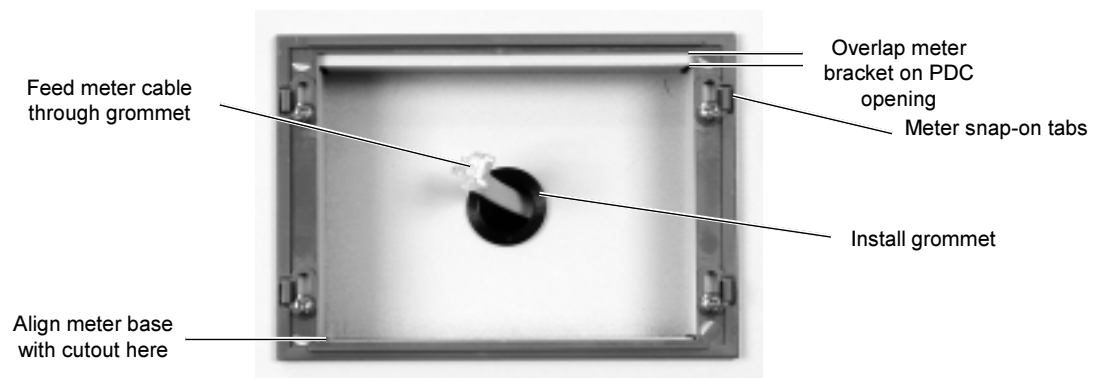
### Mounting the VO-DPM Display into the PDC

1. Remove the blank meter plate from the PDC panel by removing the four screws securing it.



**Figure 5-1**  
**Meter Cover Plate Removal**


2. Install the plastic meter bracket onto the PDC using the screws supplied. Offset the bracket on the PDC cutout so the *bottom* of the bracket aligns with the cutout. Do NOT overtighten the screws.
3. Install the protective grommet in the knockout hole and route the meter wire through it.




**Figure 5-2**  
**Meter Bracket, Cable and Grommet Installation**

## 5.0 VO-DPM INSTALLATION

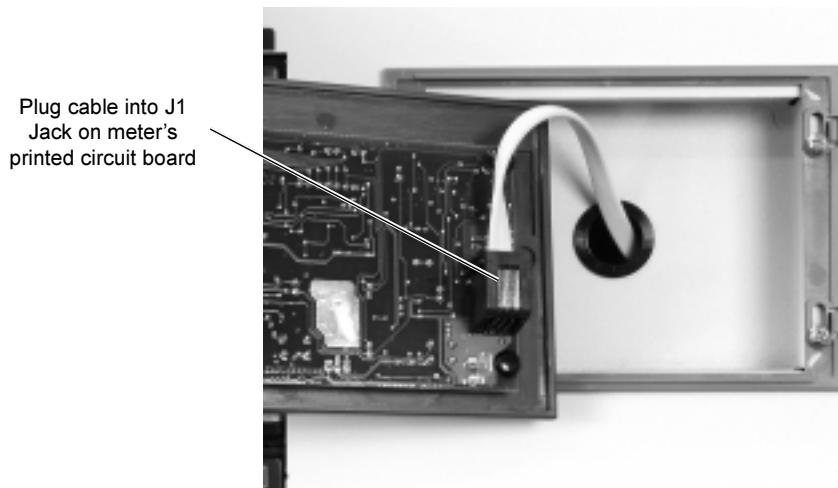
4. Connect the shunt wire to the jack labeled “J1 TO SHUNT ONLY” located on the back of the meter PCB.
5. Snap the meter onto the bracket installed in Step 2 by pressing it onto the meter bracket until it snaps on each side.

 **NOTE:** If the meter will not snap to the bracket in all four locations, check that the bracket is aligned as shown in Figure 5-2. Loosen the four screws and reposition the bracket if necessary.

6. Route the meter cable through one of the knockouts in the PDC. Use a cable clamp or grommet to prevent the cable from contacting sharp edges from the knockout.

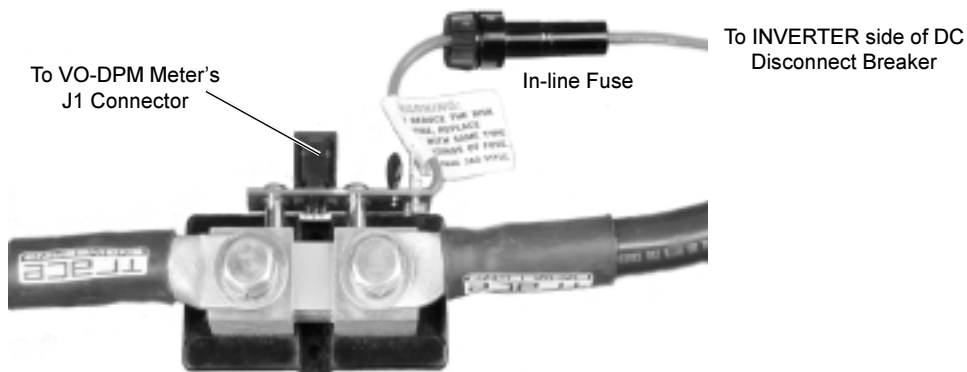
 **NOTE:** Refer to the meter's Operators manual for detailed wiring and installation details if required.

 **CAUTION: VERIFY THE SHUNT CONNECTOR IS CONNECTED TO THE CORRECT JACK OR PERMANENT DAMAGE WILL RESULT TO THE METER WHICH IS NOT COVERED UNDER WARRANTY.**

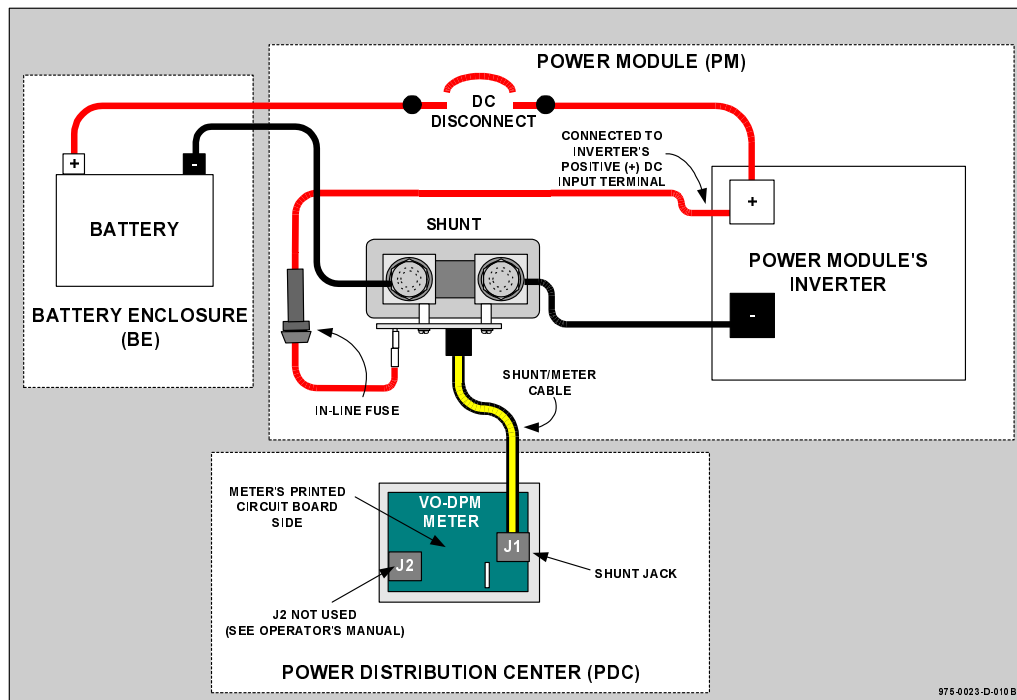


**Figure 5-3**  
**Cable Connection on VO-DPM Meter**

7. Route the meter cable to the Vesta Power Module's DC shunt. Refer to Figure 5-7 and 5-8 for shunt location in the Power Module.
8. Connect the metering cable to the shunt/PCB assembly.

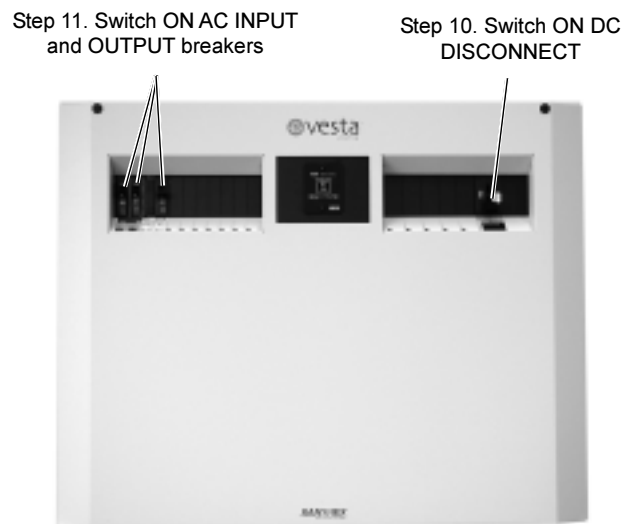


**Figure 5-4**  
**Shunt Components**



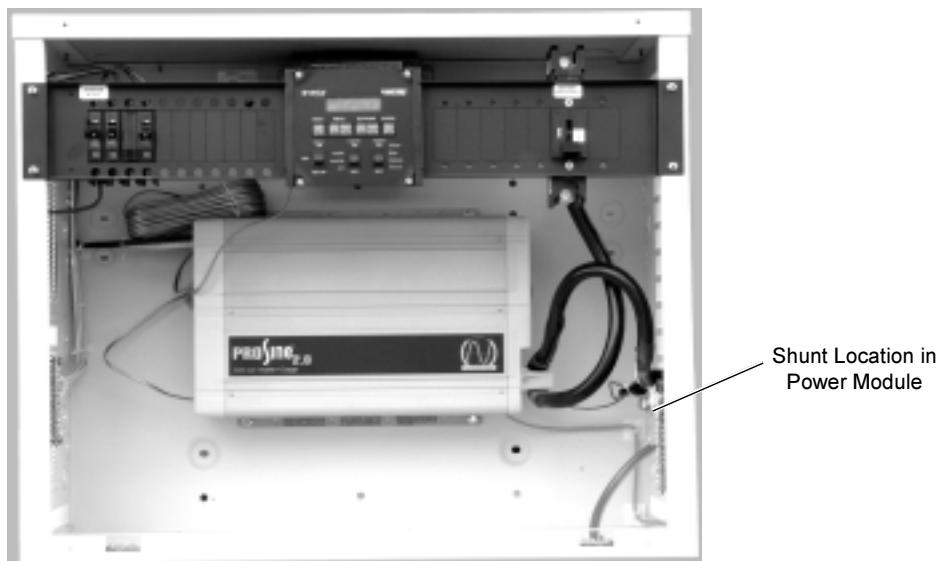
**Figure 5-5**  
**VO-DPM Meter/Shunt and PCB Wiring**

9. Replace the Power Module cover.
10. Switch ON the Vesta Power Module's DC disconnect. The meter display should turn ON.
11. Switch ON the Vesta Power Module's AC INPUT and OUTPUT breakers.
12. Refer to the Vesta DPM Operator's manual for additional setup details.

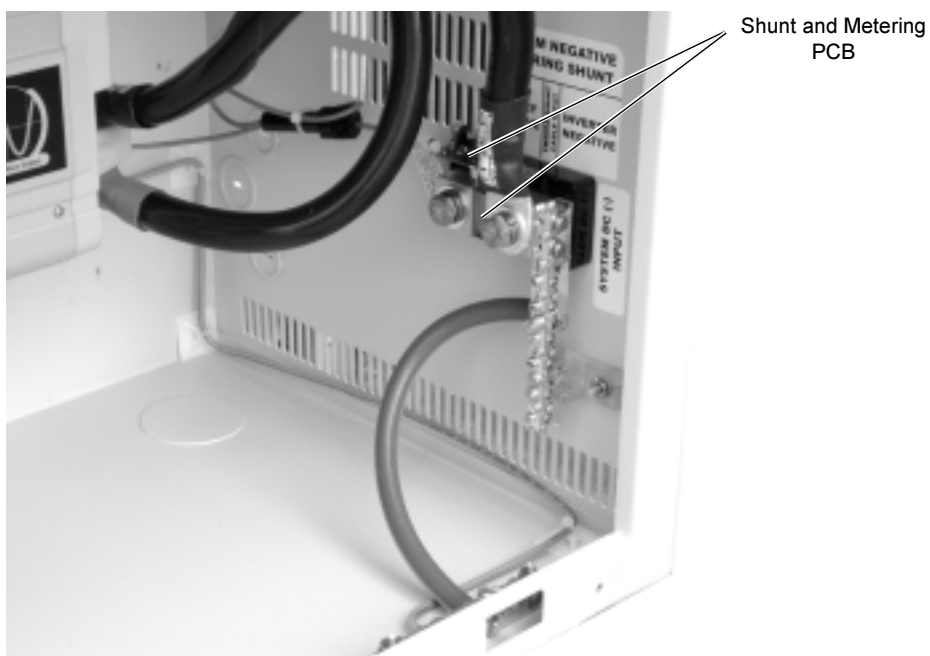


**Figure 5-6**  
**Switch ON Power Module's Circuit Breakers**

## 5.0 VO-DPM INSTALLATION



**Figure 5-7**  
**Shunt Location in Power Module**



**Figure 5-8**  
**Close-up of Shunt and Metering PCB**

During normal utility grid operation:

- All circuits should be powered from the utility power.
- The Generator Manual Transfer assembly should be switched to “UTILITY.”
- All UTILITY LOAD CONTROL circuit breakers should be switched ON and the UTILITY POWER AVAILABLE light should be ON.

When a utility grid failure occurs, the PDC will automatically transfer the critical loads (connected to the Vesta backup circuits) to Vesta inverter backup power. During a utility outage, the loads connected to the UTIL/GEN breakers will be powered when the generator is started.



NOTE: To extend battery run-time for the most critical applications, switch OFF the lower priority loads.

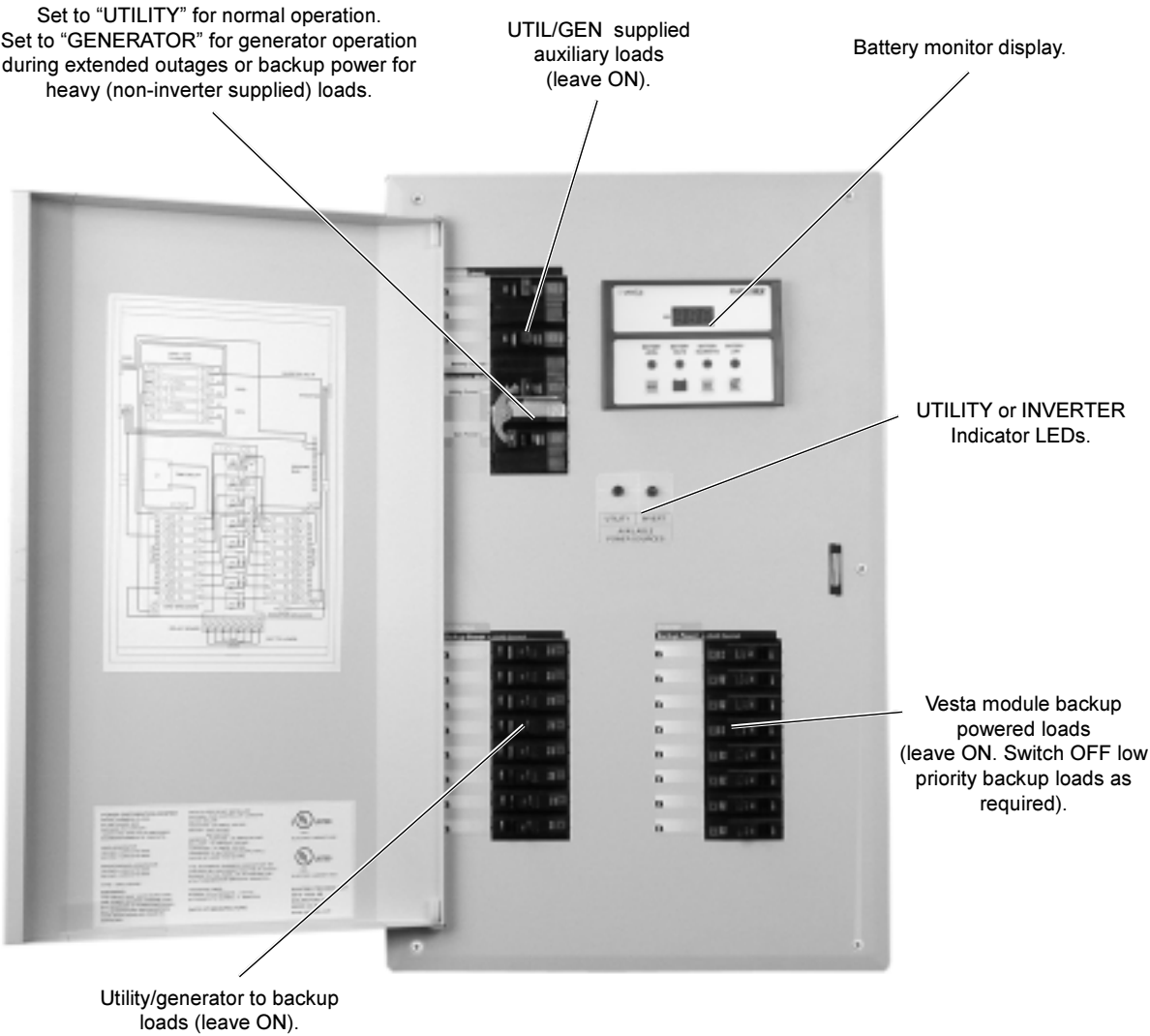
During an *extended* outage the Vesta backup power system can drain the batteries to a point where they can no longer supply the loads. If this condition should occur, or the generator-only loads need to be operated:

- Plug the generator into the Vesta Generator Inlet receptacle (if not permanently hard wired into the system). Refer to section 4.
- Start the generator and allow a few minutes for it to warm-up and stabilize.
- Switch the Generator Transfer switch to the “GEN” position. Loads connected to the Vesta power module as well as the UTIL/GEN loads will now be powered and the backup batteries will be recharging. If powering heavy loads from the generator and operating all eight backups circuits, some low priority loads may need to be switched OFF to prevent overloading the generator.
- Stop the generator when the batteries are fully charged (as shown on the battery monitoring display, if installed) or utility power returns.
- When utility power returns, switch the Generator Transfer to “UTIL” to supply utility grid power to all the loads and charge the batteries.
- Stop the generator (after a short cool down period).
- Switch any low priority loads back ON that may have been previously shut OFF.



NOTE: For protection, there is a five minute delay before the inverter switches to utility grid power.

6.0 OPERATION



**Figure 6-1**  
**Utility/Generator Operation**

### 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 or formal warranty registration, 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.

Xantrex agrees to supply all parts and labor to repair or replace defects 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. 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 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.

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www.xantrex.com

## 7.0 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](http://www.xantrex.com) or [www.traceengineering.com](http://www.traceengineering.com) and locate "quick links" on the home page. Click on the "Technical Support" window and select "Warranty Registration."

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## 8.0 SERVICE INFORMATION

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: \_\_\_\_\_

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## 9.0 SPECIFICATIONS

### Electrical Specifications

#### Utility/Generator

Input breakers	60 amp/30 amp interlock tie Square D QOU Series
GEN/AUX Output breakers	Up to three, 15–20 amp, Square D, QOU Series, single and dual-pole
Generator Transfer	Manual transfer switch
Generator Input	30 amp, 120/240 VAC, 3-wire flange c/w back box
UTILITY	
Load Control Breakers	15–20 amp, 120 VAC, Square D QO field installed tie bars for dual-pole operation (installer supplied)
Load Transfer	Relays, four, 20 amp, dual-pole relays (up to 5 minutes delayed return to grid)
INVERTER/GEN	
Load Control Breakers	15–20 amp breakers, Square D QOU series with ON/OFF indicator (installer supplied)

### Mechanical Specifications

Enclosure Size (H x W x D)	23" x 14.2" x 3.5" (58.4 cm x 36.07 cm x 8.89 cm)
Weight	20 lb (9.07 kg)

 NOTE: Above specifications are for a complete Power Distribution Center (PDC) or base system (RI) plus RB, GT and VO-DPM options installed.

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



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