



PV System Disconnect

INSTALLATION & OPERATION MANUAL



Preface

PV Powered

PV Powered designs, manufactures, and markets the solar power industry's most reliable photovoltaic solar inverter solutions. We've assembled a highly experienced solar power electronics design team. Our vision is to spur the widespread adoption and success of solar power, by assisting our distributors, dealers and installers in this dynamic market while ensuring that our products are the best supported, easiest to install, and most reliable solar inverters in the industry. Our innovative approach to performance monitoring provides secure and easy access to system performance and inverter status over the Internet.

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Safety Information and Conventions

Designation of Danger, Warning and Caution



DANGER

The Danger statement is used to inform the installer/operator of a situation requiring the utmost attention. Failure to heed this warning will result in serious injury or death to personnel and destruction of equipment.



WARNING

The Warning statement is used to inform the installer/operator of a situation requiring serious attention. Failure to heed this warning may result in serious injury or death to personnel and destruction of equipment.



CAUTION

The Caution statement is used to inform the installer/operator of a situation requiring attention. Failure to heed this Caution may result in injury to personnel and damage to equipment.

Revisions and Certification

For applicability of technical information with your specific product, contact PV Powered Customer Service and Technical Support at support@pvpowered.com.

Acronyms and Abbreviations

AC	Alternating Current
ANSI	American National Standards Institute
AWG	American Wire Gage
CEC	California Energy Commission
CPU	Controlled Processing Unit
DC	Direct Current
EGC	Equipment Grounding Conductor
FCC	Federal Communications Commission (US)
GEC	Grounding Electrode Conductor
GFI	Ground Fault Interrupt
LED	Light-Emitting Diode
LOTO	Lockout Tagout
LP	Low Power
MPPT	Maximum Power Point Tracking
NEMA	National Electrical Manufacturers Association
NEC	National Electric Code
NFPA	National Fire Protection Association
PV	Photovoltaic
STC	Standard Test Condition
UL	Underwriters Laboratory
VAC	Voltage Alternating Current
VDC	Voltage Direct Current
VFD	Vacuum Fluorescent Display
VOC	Voltage Open Circuit
VOC_TC	Voltage Open Circuit, Temperature Coefficient

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1. Installation and Safety

The PV System Disconnect is a separate but necessary and integrated part of the PV Powered Grid-tied Residential Inverter installation. The PV System Disconnect is designed for use with the PVP1100W, PVP2000W, PVP2500W, PVP2800W, PVP3000W, PVP3500W, PVP4600W, PVP4800W and PVP5200W inverters.

The PV System Disconnect is tied to both electrical sources, the utility grid and the PV system array for each inverter. The PV System Disconnect provides the disconnect for DC and AC connections.

This manual provides information necessary for the safe installation and operation of the PV System Disconnect.

1.1 Installing the PV System Disconnect

The inverter and the PV System Disconnect ship as an integrated unit. When the inverter installation is complete, the PV System Disconnect also needs to be secured to the wall.

1. Make sure the AC/DC ON/OFF switch is in the OFF position.
2. Remove the screws around the edge of the PV System Disconnect's front cover and remove the lid.
3. Secure the PV System Disconnect to the wall at the two internal locations using a rubber washer with a #13 zinc or stainless steel screw. The rubber washer seals the hole. The screws must secure to a single stud for rigidity. Refer to the wall mount template for specific locations.

The PV System Disconnect remains in place when the inverter is removed for service.

1.2 General Safety

IMPORTANT SAFETY INSTRUCTIONS: This product has been engineered and manufactured to ensure your personal safety. Improper installation and operation may result in potential electrical shock or burns. Read and follow all instructions for installation, use and servicing of this product. Read all safety warnings before installing or operating the inverter and disconnect.

The PV System Disconnect has a locking on/off switch. When the switch is in the off position, a lock can be inserted through the switch so it cannot be opened. It is the responsibility of the end user to provide the lock.

SAVE THESE INSTRUCTIONS: This manual contains important instructions for the PV System Disconnect that must be followed during installation and maintenance.

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ CONSERVER CES INSTRUCTIONS. CETTE NOTICE CONTIENT DES INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ.



CAUTION

All electrical installations should be done in accordance with local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.

Only qualified electricians should make the connection between the PV System Disconnect and the utility grid.

When exposed to light, photovoltaic (PV) arrays create electrical energy that cause a hazardous condition. To avoid this, completely cover the surface of all PV arrays with opaque (dark) material before wiring them.

The PV System Disconnect contains no user-serviceable parts. Refer maintenance to qualified service personnel.

2. Wiring

2.1 Wiring Requirements

The design intent of the inverter and PV System Disconnect assembly is to provide a safe method of connecting the inverter from the PV system array and the utility service source circuits. The PV System Disconnect provides a single location for terminating AC, DC and ground conductors.

In addition, the PV System Disconnect provides the following:

- An AC/DC ON/OFF disconnect switch to the PV array and the utility service, and functions as a wire raceway.
- Is shipped with the inverter as an integrated assembly, housed individually: an inverter and a disconnect.
- Allows an inverter to be removed for service while leaving the PV System Disconnect in place.



CAUTION

All electrical installations should be done in accordance with local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.

Only qualified electricians should make the connection between the PV System Disconnect and the utility grid.

When exposed to light, photovoltaic (PV) arrays create electrical energy that cause a hazardous condition. To avoid this, completely cover the surface of all PV arrays with opaque (dark) material before wiring them.

The PV System Disconnect contains no user-serviceable parts. Refer maintenance to qualified service personnel.

2.2 Wiring Information

Wire raceway

The wire raceway is the cavity in the bottom of the PV System Disconnect cabinet. The wire raceway is designed to accommodate the wiring of multiple inverters with PV System Disconnects. Additional knockouts on each PV System Disconnect cabinet provides access for running the AC and DC source circuits and system grounding conductors through the raceway. There is room for expanding the knockouts if it is required.

Conductor size and stripping length

Use a conductor size as specified by NEC. Strip all conductors 9 mm (3/8 inch) and torque to a maximum 1.8Nm (16 in-lbs). Use copper conductors only, rated at 90° C.

2.3 AC Circuit Breaker Requirements

The main utility service panel must dedicate a single- or multi-pole breaker to operate each installed 120/240/208 VAC PV Powered Inverter. This circuit breaker must be sized to handle the rated maximum output voltage and current of the PV Powered Inverter and PV System Disconnect. Refer to the *Circuit Breaker Requirements* in Appendix A.

An exception exists if a dedicated PV system AC sub-panel is used to combine multiple inverters. The dedicated PV system AC sub-panel requires a single breaker at the main utility service panel for a multiple inverter installation.

3. Disconnect Requirements

The PV System Disconnect is a PV array and utility grid disconnect switch that connects or disconnects both AC and DC source circuits using a single switch.



WARNING: Shock hazard

Do not remove the PV System Disconnect after is installed.

The AC/DC disconnect switch in the PV System Disconnect is compliant with UL 98. This is a non-serviceable component and needs to remain in place even during removal of the inverter. Removal of the PV System Disconnect can expose energized conductors.

Use caution when working around DC source circuits. Although the AC/DC disconnect switch disconnects the inverter from both AC and DC source circuits, hazardous voltages may still be present on the source side of the switch and inside the PV System Disconnect housing.

3.1 Single-point Grounding

The PV System Disconnect uses a single-point grounding connection, the grounding lug, providing continuity for both the Equipment Grounding Conductor (EGC) and Grounding Electrode Conductor (GEC).

The grounding lug is permanently bonded to the metal of the PV System Disconnect. The inverter and the PV System Disconnect are connected by copper conductors and do not rely on conduit connections for bonding. All ground connections between the inverter cabinet and the PV System Disconnect cabinet are completed at the factory. During installation you will complete the ground connections by:

- Connecting the GEC coming from the PV system array, and
- Connecting the EGC coming from the main utility service panel.

The following figure shows the pre-existing ground connections between the inverter and disconnect cabinets and the location of the ground connections that need to be completed. For information on connecting or disconnecting the single-point ground when replacing the inverter, see *Connecting the Ground Conductors of Multiple Disconnects* in the next chapter.

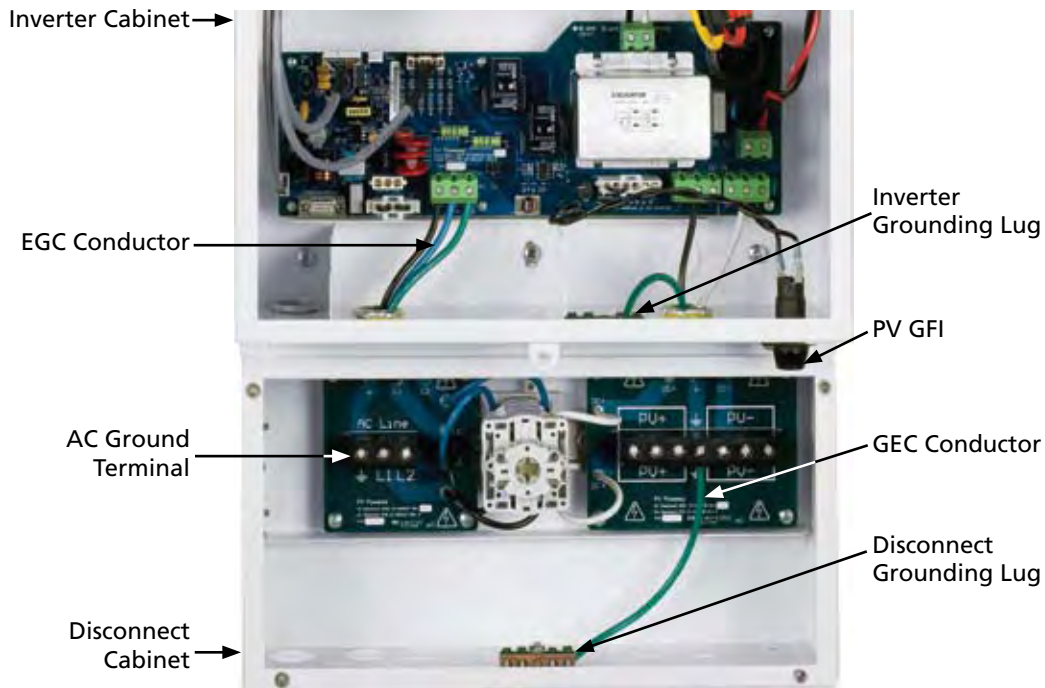


Figure 3-1 Grounding of the Inverter and PV System Disconnect

The grounding lug is attached to the PV System Disconnect cabinet with a 10-32 bolt. The grounding lug is provided to facilitate the system ground bonding to the cabinet. This is the only place the GEC should be connected to the PV System Disconnect.

- Do not tie the GEC to the PV array's positive or negative conductors. This would defeat the PV Ground Fault Interrupter (GFI). Refer to above figure for illustrated information.
- Refer to the following table for appropriate sizing of the GEC conductor. Use the maximum current AC or DC, whichever is larger, and multiply it by 1.25 to get the maximum current rating per NEC 690.

Maximum Current Rating (AMPs)	Minimum Size of Grounding Electrode Conductor AWG	
	Copper	Aluminum Copper Clad
15	8	6
20	8	6
30	8	6
40	8	6
60	8	6

Table 3-1 Grounding Electrode Conductor Size

The following figure is a schematic representation of the PV Powered single-point grounding. The front lid is grounded through the metal pem insert which accepts each screw securing the lid.

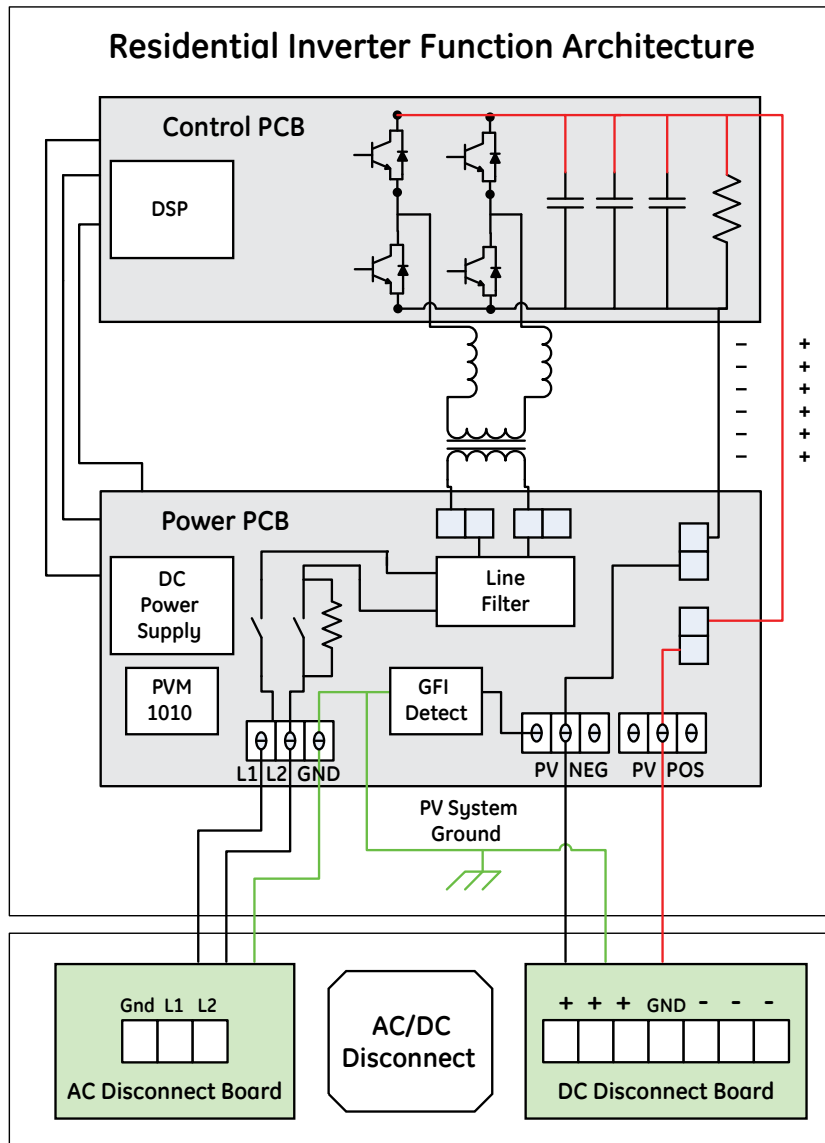


Figure 3-2 System Block Diagram of Single-point System Ground

For information about grounding multiple inverters and PV System Disconnects, see *Connecting the Ground Conductors of Multiple Units*.

3.2 Electrical Connections



CAUTION

The National Electrical Code (NEC) requires that the inverter and the PV System Disconnect be connected to a dedicated circuit with no other outlets or devices connected to the same circuit. See NEC Section 690-64(b)(1). The NEC places limitations on the size of the inverter and the manner in which the PV System Disconnect is connected to the utility grid. See NEC Section 690-64(b)(2).

To reduce the risk of fire, connect the inverter and the PV System Disconnect to the appropriate size circuit breaker provided in the following table. Maximum branch-circuit over-current protection is calculated in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.

Circuit Breaker Requirements

Inverter Model	Circuit Breaker Required
PVP1100W	1 pole 15A
PVP2000W	2 pole 15A
PVP2500W	2 pole 20A
PVP2800W	2 pole 20A
PVP3000W	2 pole 20A
PVP3500W	2 pole 20A
PVP4600W	2 pole 30A
PVP4800W	2 pole 30A
PVP5200W	2 pole 30A

Table 3-2 Required Branch Circuit Protection



WARNING

Electrical connections must be completed in accordance with local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70. Use 12 AWG, minimum, 90°C copper wire for all inverter electrical connections. Voltage drop as well as other considerations may dictate using larger conductor sizes.



WARNING

Ensure the main circuit breaker in the utility service panel is switched OFF before wiring the inverter and the PV System Disconnect. This circuit breaker should be switched ON only after all wiring has been completed as described in this manual.

**CAUTION**

The AC/DC input and output circuits are isolated from the enclosure. The PV equipment GEC, where required by Sections 690-41, 690-42 and 690-43 of the National Electric Code (NEC), ANSI/NFPA 70, is the responsibility of the installer. Failure to properly install the system ground for the PV equipment GEC can result in exposed metallic surfaces becoming energized to the full potential of the PV array.

4. Wiring the Disconnect

4.1 Accessing the PV System Disconnect's Wiring Terminals

To access the disconnect's wiring terminals:

1. Make sure the AC/DC ON/OFF switch is in the OFF position.
2. Remove the screws around the edge of the PV System Disconnect's front cover and remove the lid.

Now the disconnect's wiring terminals are accessible. Refer to the following figure to review the terminal locations.

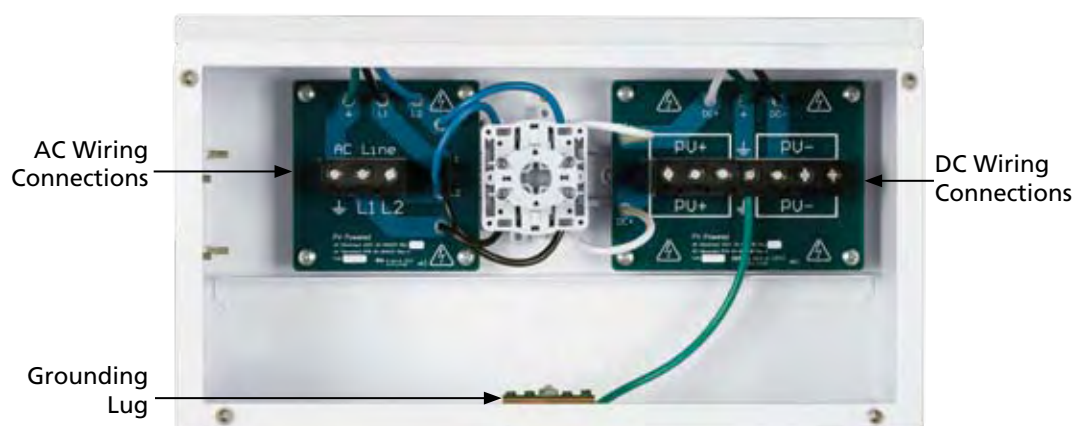


Figure 4-1 PV System Disconnect's Wiring Terminal Locations

4.2 Wiring the PV System Disconnect to External Connections

Connecting to the PV System Array

The DC input terminals provided in the disconnect accept up to 6 AWG multi-stranded conductors from the PV system array.

1. Calculate the maximum open circuit voltage (VOC) for each series of modules based on NEC 690-7.

NOTE: For all temperature conditions, the VOC for each series connection must total less than the 500 VDC for all residential inverter models.

Inverter Model	Maximum Inverter Start Voltage	Absolute Maximum Input Voltage
PVP1100W	450VDC	500VDC
PVP2000W	450VDC	500VDC
PVP2500W	450VDC	500VDC
PVP2800W	450VDC	500VDC
PVP3000W	450VDC	500VDC
PVP3500W	450VDC	500VDC
PVP4600W	450VDC	500VDC
PVP4800W	450VDC	500VDC
PVP5200W	450VDC	500VDC

Table 4-1 PV Open Circuit Voltages

2. Clearly label the positive, negative and ground conductors coming from the PV system array.
3. Select a knockout to route the conductors into the disconnect and insert a water-tight fitting.
4. Route the PV system array's conductors through the fitting. Make sure the positive is connected to the positive, negative to negative, and the GEC is terminated at the grounding lug.

Connecting to the Utility Grid

The PV System Disconnect is connected to the main utility service panel using three conductors: Line 1, Line 2/N and EGC.

NOTE: To avoid an increase in AC voltage level, which may lead to nuisance faults, PV Powered recommends sizing the conductor for a drop of less than 2%.

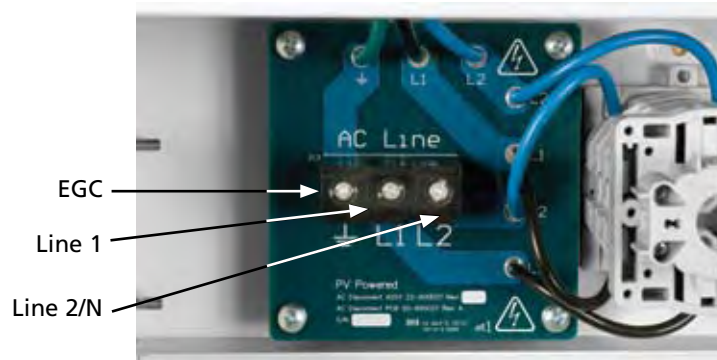


WARNING

Ensure the main circuit breaker at the utility service panel is switched off before connecting to the AC terminal block.

1. Run the AC conductor from the main utility service panel to the PV System Disconnect using an NEC compliant method.
2. Insert a water-tight fitting into the PV System Disconnect's knockout and secure the fitting with a locking nut.
3. Feed the Line 1, Line 2/N and EGC conductors through the conduit and into the selected knockout of the PV System Disconnect.
4. Connect the EGC conductor to the terminal displaying the symbol \perp inside the disconnect.
5. Connect the Line 2/N conductor to the terminal marked "L2" inside the disconnect. (For the PVP1100W this is the neutral conductor.)
6. Connect the Line 1 conductor to the terminal marked "L1" inside the disconnect.

7. Ensure all connections are wired correctly and properly torqued. Tighten the terminal block screws to 24 in-lbs.



**Figure 4-2 Connections for the PV System Disconnect's AC Conductors:
EGC, Line 1 and Line 2/N**

This completes the wiring for the inverter and PV System Disconnect to the PV system array and the electric utility.

Closing the PV System Disconnect

1. Replace the PV System Disconnect's lid and tighten the four screws.



WARNING

Before turning on the inverter and PV System Disconnect, ensure that the front panel is closed properly and the lid's screws are tightened.

2. To start the inverter with the PV System Disconnect, see the PV Powered Grid-Tied Inverter manual's *Operations* chapter.

4.3 Wiring Multiple PV System Disconnects

If there is more than one PV system array, make sure the positive, negative and ground conductors are labeled for each array. For example:

- PV array 1 = PV1 pos, PV1 neg, PV1 ground
- PV array 2 = PV2 pos, PV2 neg, PV2 ground
- PV array 3 = PV3 pos, etc.

The AC and DC wiring connections are the same for multiple and single inverter/disconnect installation. The system grounding requirements vary slightly from a single inverter to a multiple inverter installation with PV System Disconnects. The DC GEC must maintain continuity through all pieces of equipment, and careful attention must be paid to avoid ground loops.

Preparing for Wiring Multiple PV System Disconnects

The wiring raceway allows a continuous run of the AC, DC and system ground conductors between multiple inverter and PV System Disconnect units.

1. Make sure each PV System Disconnect AC/DC ON/OFF switch is in the OFF position.
2. Remove the screws from the lid of each PV System Disconnect.
3. Remove the knockouts on each PV System Disconnect to access the wiring raceway.
4. Insert a fitting in each knockout opening so a continuous, water-tight connection is created between each PV System Disconnect.
5. Route the AC, DC and the system ground conductors through each PV System Disconnect, terminating applicable connections.

For instructions on connecting the PV array and the AC conductors inside the PV System Disconnect, refer to the section *Wiring the PV System Disconnect to External Connections*.

Connecting the Ground Conductors of Multiple Units

System grounding requirements for a multiple unit system also uses a single-point ground.

1. Connect the GEC coming from the first PV array to the grounding lug inside the disconnect cabinet of the first unit.
2. Connect the remaining units with a continuous GEC, branching from grounding lug to grounding lug.
3. On each unit, connect the EGC from the utility grid to the grounding terminal of the AC connection.

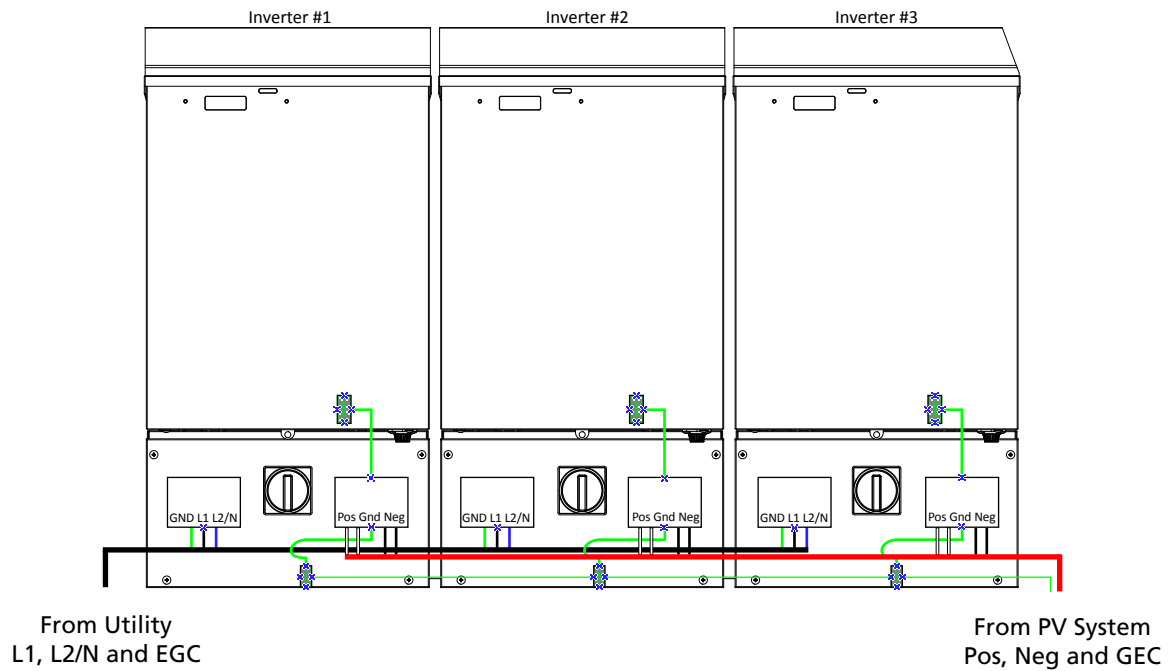


Figure 4-3 Wiring Multiple Arrays with Inverter/PV System Disconnects

To start the inverter with the PV System Disconnect, see the *PV Powered Grid-Tied Residential Inverters* manual's *Operations* chapter.

5. Service and Replacement

PV Powered provides service guidelines for disconnecting and replacing an inverter. Always request and receive an advanced replacement prior to separating the inverter from the PV System Disconnect assembly. PV Powered maintains an advanced replacement policy which provides qualified personnel with a similar inverter for immediate replacement of the unit being removed.

In the unlikely event the inverter requires replacement, the PV System Disconnect remains in place. Only the inverter is removed and immediately replaced.

Note: *If the inverter cannot be replaced immediately, it is the qualified service personnel's responsibility to provide 3/4" water-tight plugs as specified by UL 514B. These plugs need to be installed in the disconnect's knockouts to protect the inside of the AC/DC disconnect assembly from exposure to the elements.*

5.1 Accessing the Wiring Terminals

1. On the PV System Disconnect, move the AC/DC handle to the OFF position.

Note: *The AC/DC disconnect switch must be in the off position before the lid can be removed.*

Note: *The load side terminals of the AC and DC source circuits may still be energized.*

Note: *Wait five minutes before proceeding, allowing the inverter's capacitors to discharge.*

2. Remove the screws located around the front perimeter of the inverter and remove the lid.
3. Remove the screws around the front edge of the PV System Disconnect and remove the lid.

Now the wiring terminals in the inverter and PV System Disconnect are accessible. Review the following figure for terminal locations.

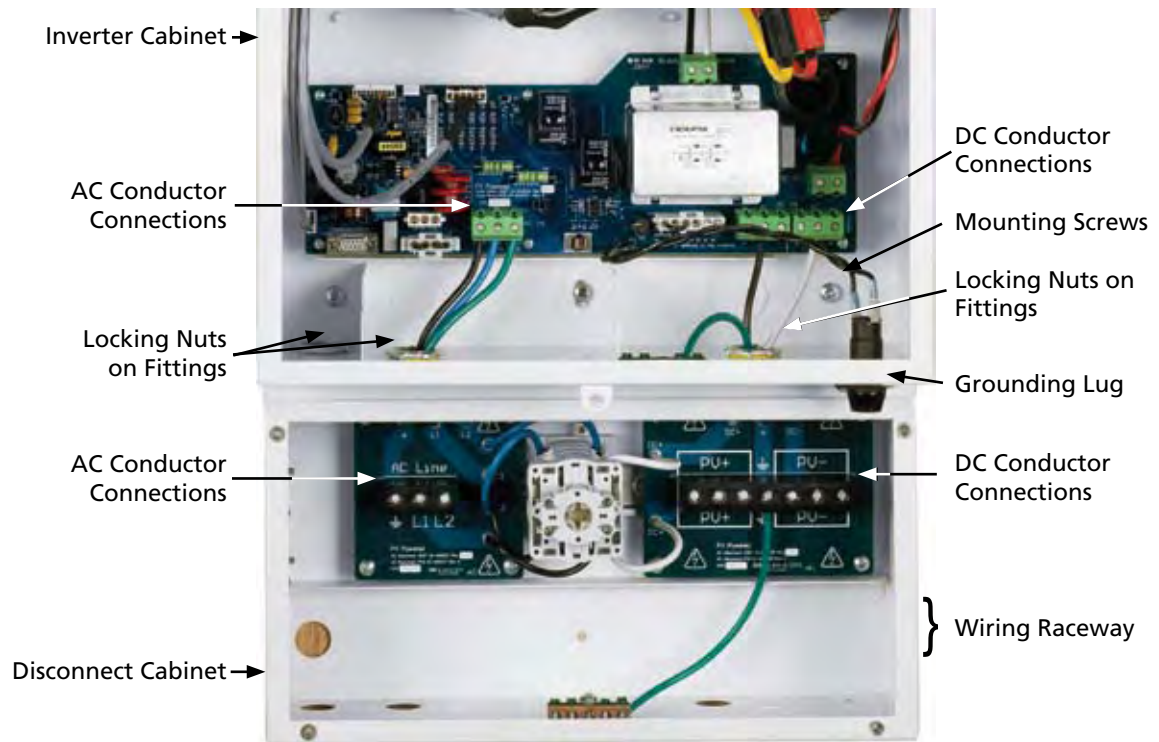


Figure 5-1 Connections between the Inverter and PV System Disconnect

5.2 Removing the Inverter

1. Disconnect the AC and DC conductors, including the GEC at the grounding lug, inside the inverter.
2. Pull all conductors down through the appropriate fitting to the wiring raceway inside the PV System Disconnect.
3. Remove the locking nuts on the conduit fittings between the inverter and the disconnect.
4. Remove the three mounting screws in the lower section of the inverter assembly to detach the inverter from the mounting bracket.
5. Lift the inverter from the mounting bracket.
6. Replace the lid on the inverter.

5.3 Replacing the Inverter

1. Remove the screws and the lid on the replacement inverter.
2. Place the replacement inverter on the mounting bracket.
3. Replace the three mounting screws in the lower section of the inverter assembly to secure the inverter to the mounting bracket.
4. Reinstall each of the fittings with their locking nuts in the knockouts for the conductors.

5.4 Wiring the Replaced Inverter to the PV System Disconnect

The PV System Disconnect connections are arranged in the following configuration:

- The left side is dedicated to AC.
- The right side is dedicated to DC.

DC Connections

To wire the DC conductors from the PV System Disconnect to the replaced inverter:

1. Route the DC conductors through the correct fitting and into the inverter.
2. Connect the DC conductors to the DC wiring terminals inside the inverter.
 - Connect positive to positive.
 - Connect negative to negative.
 - GEC is terminated at the grounding lug.

AC Connections

To wire the AC connections from the PV System Disconnect to the replaced inverter:

1. Route the AC conductors through the correct fitting and into the inverter.
2. Connect the EGC conductor to the GND terminal.
3. Connect the conductor coming from “L2” in the disconnect to the terminal marked “Line 2/N” inside the inverter. (For the PVP1100W this is the neutral conductor.)
4. Connect the conductor coming from “L1” to the terminal marked “Line 1” inside the inverter.
5. Ensure all connections are wired correctly and properly torqued. Tighten the terminal block screws to 24 in-lbs.

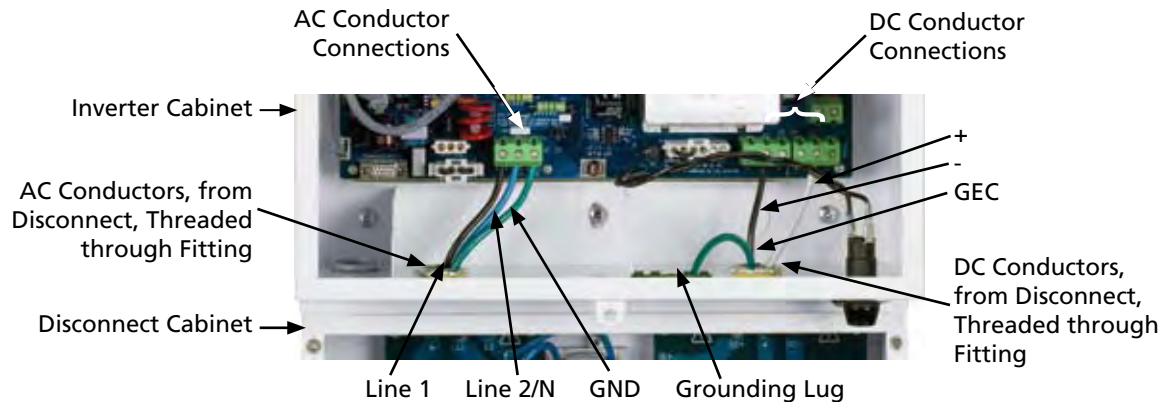


Figure 5-2 Reconnecting the Inverter's Conductors

5.5 Finishing the Replacement

1. Replace the lids and the screws securing the lids for the inverter and the PV System Disconnect.

To start the inverter with the PV System Disconnect, see the *PV Powered Grid-Tied Inverter* manual's *Operations* chapter.

Appendix A - Specifications

The specifications detailed below are technical specifications and should be used in designing your PV system in accordance with the NEC.

Specification	Value
Switch orientation	AC/DC ON AC/DC OFF
Input/output wire sizes	12 AWG, minimum 6 AWG maximum 90°C copper wire
Max. DC voltage	500 VDC
Max. DC current	48 IDC
Max. continuous current	> 26 IDC
Max. AC voltage	600 VAC
Max. AC current	40 IAC
Number of terminals	3 positive/3 negative
Enclosure type	NEMA 3R
Weight (lbs)	5
Dimensions (H x W x D) Small Large	15 3/8" x 6 5/8" x 8 1/2" 17 7/8" x 6 5/8" x 8 1/2"
Compliance	NEC, UL98
Operating temperature range	-30°C to 50°C

Table A-1 PV System Disconnect Technical Specifications

Terminal	Torque Value
AC & DC terminal blocks	
Black	24 in-lbs.
Green	4 in-lbs.

Table A-2 Torque Values

Inverter Model	Circuit Breaker Required
PVP1100W	1 pole 15A
PVP2000W	2 pole 15A
PVP2500W	2 pole 20A
PVP2800W	2 pole 20A
PVP3000W	2 pole 20A
PVP3500W	2 pole 20A
PVP4600W	2 pole 30A
PVP4800W	2 pole 30A
PVP5200W	2 pole 30A

Table A-3 Circuit Breaker Requirements

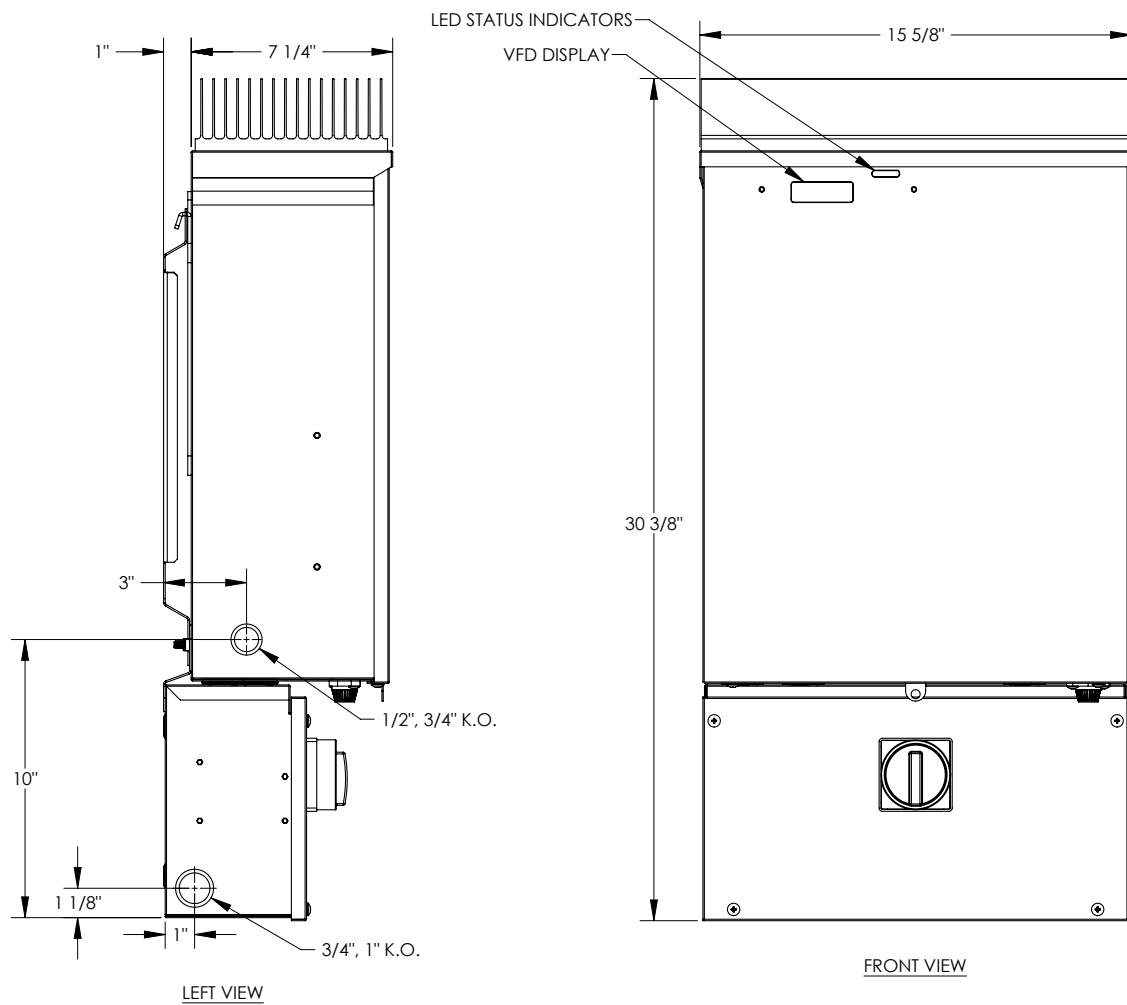


Figure B-1 Side and Front Views of PVP1100W, PVP2000W, PVP2500W, PVP2800W, PVP3000W, and PVP3500W Inverter Cabinet

APPENDIX B

B.1 Schematics for PVP1100W, PVP2000W, PVP2500W, PVP2800W, PVP3000W, and PVP3500W Inverter Cabinet

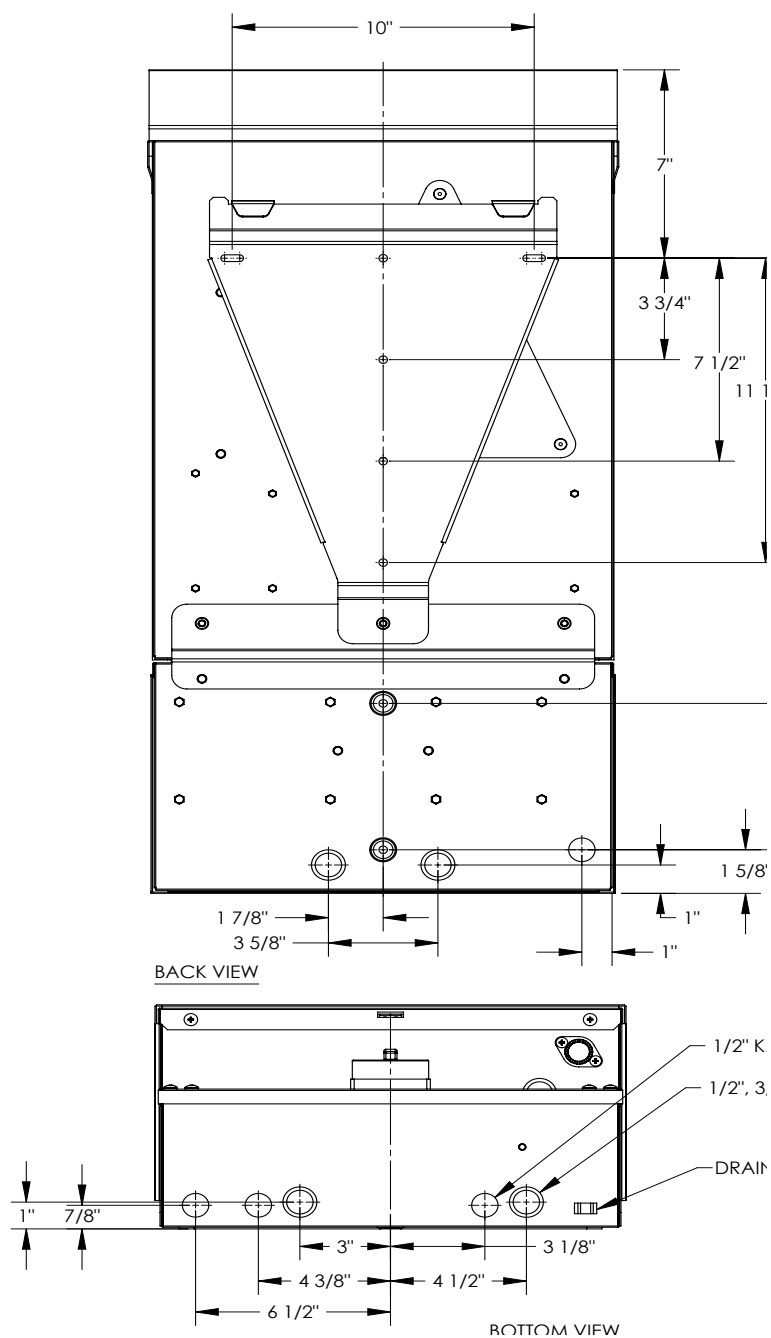


Figure B-2 Back and Bottom Views of PVP1100W, PVP2000W, PVP2500W, PVP2800W, PVP3000W, and PVP3500W Inverter Cabinet

B.2 Schematics for PVP4600W, PVP4800W, and PVP5200W Inverter Cabinet

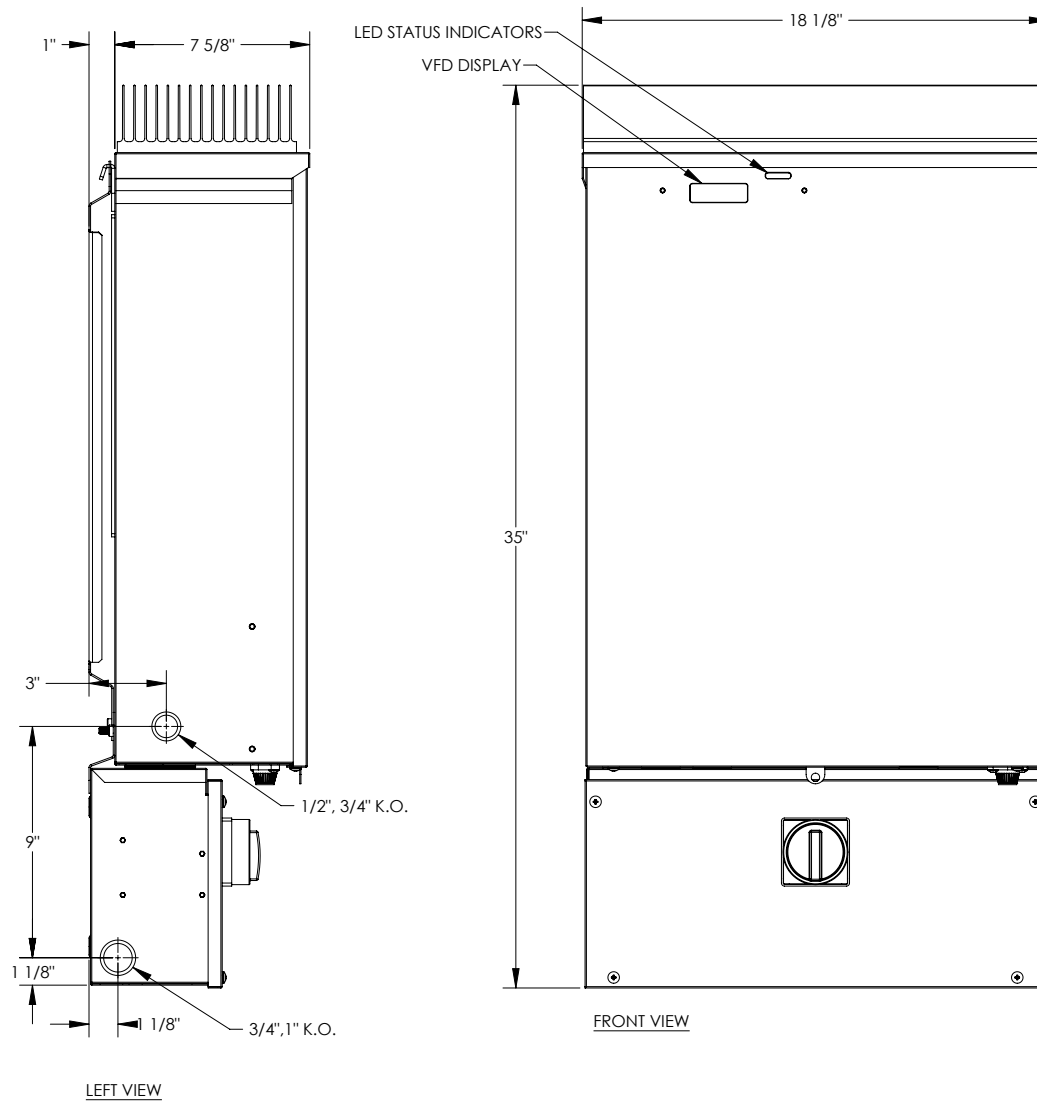


Figure B-3 Side and Front Views of the PVP4600W, PVP4800W, and PVP5200W Inverter Cabinet

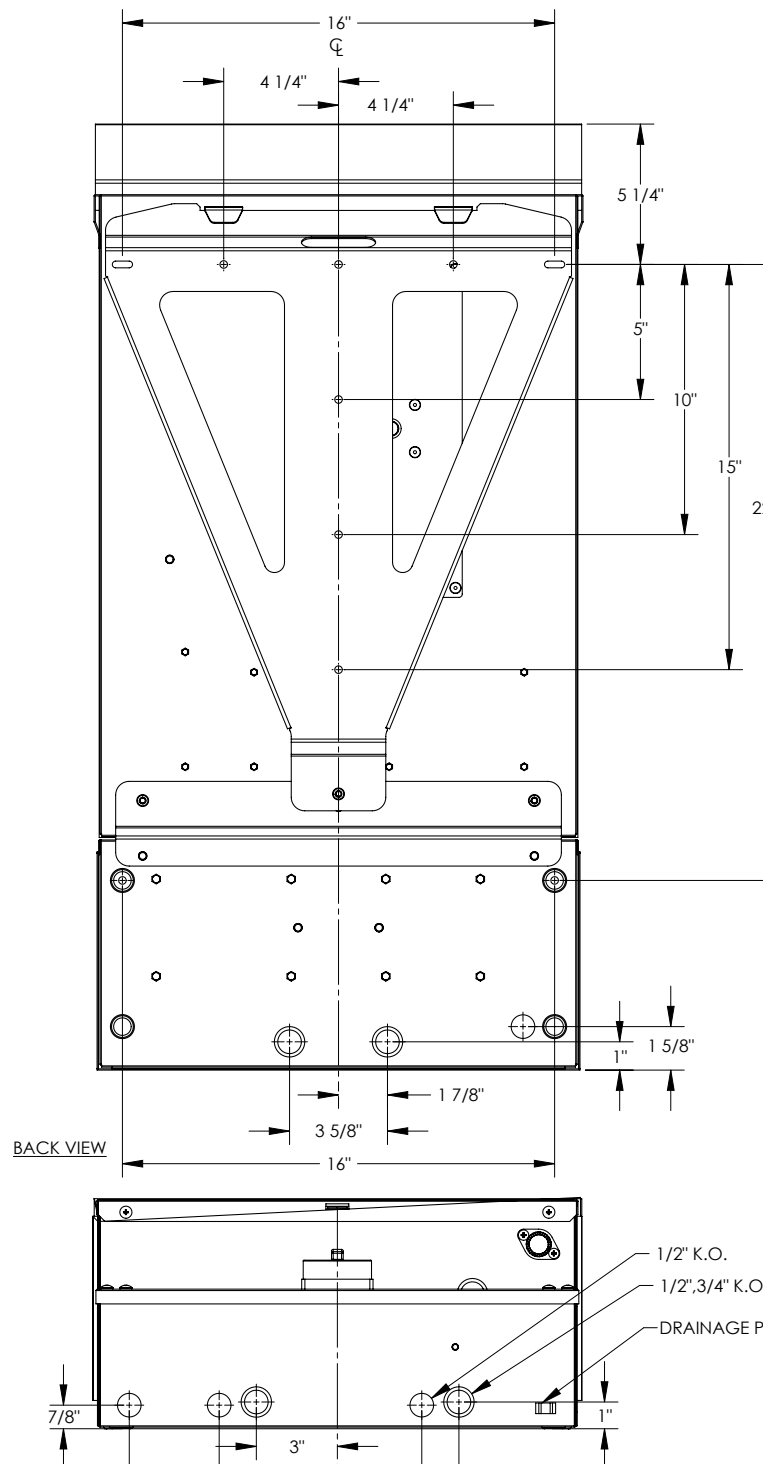


Figure B-4 Back and Bottom Views of the PVP4600W, PVP4800W, and PVP5200W Inverter Cabinet

Limited Warranty

PV Powered, Inc. provides a limited warranty for your residential or commercial inverter and optional data monitoring module for defects caused by material or manufacturing flaws. The inverter and the data monitoring module must be installed and maintained by a qualified installer in order for the warranty to be valid.

Terms of Coverage

The warranty period for the inverter is ten years, and the warranty on the data monitoring module is one year, each beginning on the date of purchase by the original end user.

Coverage

PV Powered will, at its option, repair or replace the defective component(s) free of charge, provided that you notify PV Powered of the defect during the warranty period, have a dated proof of purchase, and PV Powered determines that the defect is covered by the limited warranty set forth above. PV Powered reserves the right to inspect the defective component(s) and determine if the defect is due to material or manufacturing flaws. PV Powered also reserves the right to charge a fee for service time expended if the defect is not due to material or manufacturing flaw or is not for some other reason subject to this limited warranty.

PV Powered will, at its option, use new and/or reconditioned parts in performing warranty repair and in building replacement products. PV Powered reserves the right to use parts or products of original or improved design in the repair or replacement. If PV Powered repairs or replaces a product, its warranty continues for the remaining portion of the original warranty period or 90 days from the date of the return shipment to the customer, whichever period expires later. All replaced products and all parts removed from repaired products become the property of PV Powered.

For defects covered by this limited warranty, PV Powered will provide, at no additional cost to the customer, both parts and labor necessary to repair the product, and return shipment to the customer via a PV Powered selected, non-expedited, surface freight carrier within the United States and Canada.

What is Not Covered

PV Powered does not warrant its products from any and all defects or damage caused by:

- Normal wear and tear.
- Shipping or transportation damages.
- Improper installation.
- Improper maintenance.
- Excessive voltage or current conditions from the electrical grid or PV panels.

- Exposure to unsuitable environmental conditions (including but not limited to damage due to lightning strikes, storm, fire, flood, etc.).
- Unauthorized or abnormal use, repair, modification, or operation.
- Negligence or accidents.
- Material or workmanship not provided by PV Powered or its authorized service centers.

This warranty also does not cover costs related to the removal, installation, or troubleshooting of your electrical systems.

Disclaimer and Limitation of Liability

EXCEPT FOR THIS EXPRESS LIMITED WARRANTY, PV POWERED EXPRESSLY EXCLUDES ALL WARRANTIES WITH RESPECT TO THE INVERTER AND DATA MONITORING MODULE, EXPRESS AND IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTY OF MERCHANTABILITY, THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES THAT MAY HAVE ARISEN FROM COURSE OF DEALING OR USAGE OF TRADE.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, PV POWERED'S AGGREGATE MONETARY LIABILITY TO THE CUSTOMER FOR ANY REASON AND FOR ANY AND ALL CAUSES OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE, WILL NOT EXCEED THE AMOUNT PAID TO PV POWERED FOR THE INVERTER OR DATA MONITORING DEVICE. PV POWERED WILL NOT BE LIABLE TO YOU UNDER ANY CAUSE OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE, FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, EVEN IF PV POWERED HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE ORIGINAL PRICE FOR THE INVERTER AND DATA MONITORING MODULE AND PV POWERED'S OBLIGATIONS UNDER THIS EXPRESS LIMITED WARRANTY ARE CONSIDERATION FOR LIMITING PV POWERED'S LIABILITY.

IF THIS PRODUCT IS A CONSUMER PRODUCT, FEDERAL LAW DOES NOT ALLOW AN EXCLUSION OF IMPLIED WARRANTIES. TO THE EXTENT YOU ARE ENTITLED TO IMPLIED WARRANTIES UNDER FEDERAL LAW, TO THE EXTENT PERMITTED BY APPLICABLE LAW THEY ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. SOME STATES AND PROVINCES DO NOT ALLOW LIMITATIONS OR EXCLUSIONS ON IMPLIED WARRANTIES OR ON THE DURATION OF AN IMPLIED WARRANTY OR ON THE LIMITATION OR EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION(S) OR EXCLUSION(S) MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE OR PROVINCE TO PROVINCE.

Arbitration

IN THE EVENT OF A DISPUTE BETWEEN PV POWERED AND ANY PURCHASER COVERED UNDER THIS WARRANTY, TO THE MAXIMUM EXTENT ALLOWED BY LAW, THE PURCHASER AGREES TO RESOLVE ANY AND ALL SUCH DISPUTES USING BINDING ARBITRATION IN ACCORDANCE WITH THE RULES AND PROCEDURES OF THE ARBITRATION SERVICE OF PORTLAND, INC., AND JUDGMENT UPON AWARD RENDERED PURSUANT TO SUCH ARBITRATION SHALL BE BINDING ON THE PARTIES. THE LOCATION FOR ANY ARBITRATION HEARINGS SHALL BE BEND, OREGON. THE PRICE FOR THE INVERTER OR PVM1010 DEVICE AND PV POWERED'S OBLIGATIONS UNDER THIS EXPRESS LIMITED WARRANTY ARE CONSIDERATION FOR THIS BINDING ARBITRATION PROVISION.

Miscellaneous Provisions

This limited warranty will be governed and interpreted exclusively in accordance with the laws of the state of Oregon, without reference to provisions concerning conflicts of laws. If any provision of this limited warranty is found by any court or arbitrator to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not be affected thereby. This limited warranty constitutes the entire contract between the parties concerning the subject matter of this warranty and supersedes all marketing brochures and other expectations, understandings, communications, representations and agreements, whether verbal or written, between the parties.

Return Procedure

Before returning the product directly to PV Powered, you must first obtain a Return Materials Authorization Number (RMA) from PV Powered. You must also pre-pay for shipping. When you contact a PV Powered representative, please have the following information ready:

1. The serial number of the product
2. The reason for the return
3. A copy of your dated proof of purchase

When you return the product to PV Powered, PV Powered advises that you use the original packaging or its equivalent, and that you fully insure the shipped product. PV Powered is not responsible for damage to the product due to improper packaging.

On the packaging, please include the following:

1. Clearly mark the Return Materials Authorization Number (supplied by PV Powered) on the outside of the box.
2. A return address where the product can be shipped.
3. A telephone number where you can be reached during business hours.
4. A brief description of the problem.

Ship the product prepaid to the address provided by your PV Powered representative.

Information about Your System

Note the following information for your records, and retain your dated proof of purchase:

Serial Number _____

Purchased From _____

Date of Purchase _____

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