



PD9100 / 9200 SERIES POWER CONVERTER OWNERS MANUAL

PROGRESSIVE DYNAMICS, INC. POWER CONVERTER LIMITED WARRANTY

- I. **LIMITED WARRANTY:** Progressive Dynamics, Inc. warrants its power converter to be free from defects in material or workmanship under normal use and service; and limits the remedies to repair or replacement.
- II. **DURATION:** This warranty shall extend for a period of two years from the original date of purchase, and is valid only within the continental limits of the United States and Canada.
- III. **WARRANTY EXCLUSIONS:** This warranty specifically does not apply to:
 - A. Any power converter which has been repaired or altered in any way by an unauthorized person or service station;
 - B. Damage caused by excessive input voltage, misuse, negligence or accident; or an external force;
 - C. Any power converter which has been connected, installed or adjusted or used other than in accordance with the instructions furnished, or has had the serial number altered, defaced or removed;
 - D. Cost of all services performed in removing and re-installing the power converter; and
 - E. ANY LOST PROFITS, LOST SAVINGS, LOSS OF USE OF ENJOYMENT OR OTHER INCIDENTAL DAMAGES ARISING OUT OF THE USE OF, OR INABILITY TO USE, THE PRODUCT. THIS INCLUDES DAMAGES TO PROPERTY AND, TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- IV. **PROOF OF PURCHASE:** A warranty claim must be accompanied by proof of the date of purchase.
- V. **CLAIM PROCEDURE:** Upon discovery of any defect, Progressive Dynamics, Inc. shall be supplied the following information at the address listed below:
 - A. Name and address of the claimant;
 - B. Name, model and serial number of the power converter;
 - C. Application in which the power converter was installed. (Includes manufacturer, model and model year where applicable)
 - D. Date of purchase; and
 - E. Complete description of the claimed defect.

Upon determination that a warranty claim exists (a defect in material or workmanship occurring under normal use and service,) the power converter shall be shipped postage prepaid to Progressive Dynamics, Inc. together with proof of purchase. The power converter will be repaired or replaced and returned postage prepaid.



Extended warranties are
available for purchase at
www.progressivedyn.com

Progressive Dynamics Inc.
507 Industrial Rd.
Marshall, MI 49068
service@progressivedyn.com
www.progressivedyn.com

INSTALLATION INSTRUCTIONS

NOTES:

- Horizontal mounting of the power converter, is recommended although it can be mounted in any position that provides unobstructed ventilation to the fan and vent holes.
- The OEM should test the power converter under full load conditions in its intended mounting location. This will insure that there is sufficient unobstructed ventilation to the converter allowing it to operate at its maximum rated load. Failure to provide adequate ventilation to the converter will cause the converter output to be reduced as it responds to ambient conditions.
- The INTELI-POWER converters are not designed for zero clearance compartments.
- Use a 5/32" hex driver to tighten the output screws. Do not exceed 50 in-lbs. torque on the output terminals.
- The INTELI-POWER converters are not weather tight or designed for wet mounting locations. They must be protected from direct contact with water.
- Avoid the introduction of foreign materials into the case as this could damage or cause a malfunction of the converter.

Installation Steps:

1. Secure converter firmly to mounting surface.
 2. Connect ground lug (found on unit base) to chassis.
 - Ground wire to be between 6 and 12AWG wire.
 - Tighten lug to 25 – 35 in-lbs.
 3. Disconnect battery from both positive (+) and ground (-) cables.
 4. Connect battery ground (-) to converter NEG (-) lug.
 - Conductor to be between 2 and 14AWG (follow all applicable codes when sizing conductor)
 - Tighten lug to 30 – 50 in-lbs.
 5. Disconnect any optional pendants or modules.
 6. Plug converter into appropriate outlet.
 7. Using a DC voltmeter, verify converter output. The power converter is working properly if the voltage is above 13VDC (12V models), 26VDC (24V models), 14.3VDC (12V 9100L models), and 28.4VDC (24V 9100-24L models). **If no output is present, refer to the trouble shooting guide in this manual.**
 8. Disconnect power to converter
 9. Connect battery positive (+) to converter POS (+) lug.
 - Conductor to be between 2 and 14AWG (follow all applicable codes when sizing conductor)
 - Tighten lug to 30 – 50 in-lbs.
- Note: When connecting battery to converter POS (+), a spark may occur. This is normal.**
10. Reconnect battery to both positive (+) and ground (-) cables.
 11. Reconnect any optional pendants or modules.
 12. Reconnect power to converter.

GENERAL INFORMATION

The INTELI-POWER series power converters are state-of-the-art electronic converter / battery chargers.

Their compact size and quiet operation gives greater flexibility in selecting the mounting location for either OEM installation or after market replacement.

All INTELI-POWER series power converters have been designed and tested to provide maintenance free operation and undergone tens of thousands of hours of strenuous engineering testing to ensure years of trouble free operation.

The INTELI-POWER 9200 series converter incorporates the Charge Wizard[®] microprocessor which constantly monitors the battery voltage and automatically adjusts the converter output voltage to provide the proper charging voltage for fast recharges and long-term maintenance.

INTELI-POWER 9100 series converters incorporate the Total Charging Management System (TCMS) interface. The TCMS interface connects the converter to optional devices that can automatically control the output voltage of the converter thereby controlling the charge rate to the batteries. (See below for Charge Wizard[®] functions and performance)

INTELI-POWER 9100L series converters do NOT support the Charge Wizard[®] functionality or provide a TCMS interface. The 9100L series converters incorporate an interface for a remote shutdown module for use with a smart lithium battery system.

FEATURES

MULTIPLE BATTERY CHARGING... INTELI-POWER converters have the capability of charging multiple batteries at the same time! They can even charge a combination of different capacity batteries.

GFCI PROTECTION... INTELI-POWER converters have the LOWEST ground fault leakage. With this unit, the user can confidently utilize the RV's AC outlets without being concerned about a ground fault interruption of the facilities power source.

REVERSE BATTERY PROTECTION prevents damage if battery leads are cross connected. Since the only consequence of cross connection is a blown fuse, damage to or possible replacement of the converter is avoided. Cross connection of battery leads is the only thing that will blow these fuses.

Replacement fuses are available at any automotive store.

CAUTION

IF THE REVERSE BATTERY PROTECTION FUSES ARE BLOWN DURING INSTALLATION, CHECK TO SEE THAT THE BATTERY HAS BEEN CONNECTED PROPERLY BEFORE REPLACING THE FUSES. REPLACE THE FUSES ONLY WITH THE SAME TYPE AND RATING AS THE ORIGINAL FUSES. USING OTHER FUSES MAY RESULT IN CONVERTER DAMAGE, VEHICLE DAMAGE, INJURY OR OTHER CONSEQUENCES (SEE WARRANTY).

ELECTRONIC CURRENT LIMITING... Should demand exceed the rated capacity of the converter or a short circuit occur, the output voltage of the converter drops to almost zero until the situation is corrected. This feature prevents blown fuses, damage to the converter, 12 volt motors and wiring.

AUTOMATIC THERMAL PROTECTION... Should an over temperature condition occur, the converter will reduce power output. The converter automatically resumes normal operation when a safe operating temperature is reached.

IGNITION PROTECTION... All INTELI-POWER series converters are ignition protected.

VARIABLE SPEED COOLING FAN... An electronic sensor monitors converter temperature. Higher demand generates higher heat, requiring higher fan speeds. Lower demand means lower heat and fan speed. This means the fan may not operate at night or will operate at a very slow, quiet speed when demand is low and the owner is trying to sleep.

HIGH VOLTAGE PROTECTION... This circuit shuts the converter down if a surge or spike in input voltage is detected. The converter will automatically return to normal operation when the condition is corrected.

LOW VOLTAGE PROTECTION... INTELI-POWER converters automatically shut down if input voltage is insufficient for continued operation. When the low voltage situation is corrected, the INTELI-POWER converter automatically resumes normal operation.

GENERAL OPERATION

The INTELI-POWER series converter will supply "clean" power from input voltages that range from 90-130 VAC (205-265 VAC for 230 volt models).

The INTELI-POWER series of converters are primarily designed for use with a battery, however, the output of the INTELI-POWER converters are a regulated, filtered DC voltage that can power sensitive electronics without the need for a battery or other filtering.

At normal input voltages the full load rated capacity is available.

At input voltages less than 105 VAC (205 VAC for 230 volt models) the converter may not supply full rated output capacity.

9100L - The full rated load is available for load, battery charging or both. When functioning as a regulated battery charger the converter has a nominal voltage output of 14.6 VDC for 12 volt models and 29.2 VDC for 24 volt models. The system is designed to sense voltage on the battery and will taper the charging current as the battery becomes charged.

CAUTION

The 9100L series converter/chargers are designed to recharge lithium iron phosphate batteries.

DO NOT USE TO RECHARGE LEAD/ACID BATTERIES!

9100 - The full rated load is available for load, battery charging or both. When functioning as a regulated battery charger the converter has a nominal voltage output of 13.6 VDC for 12 volt models and 27.2 VDC for 24 volt models. The system is designed to sense voltage on the battery and will taper the charging current as the battery becomes charged.

When the vehicle is to be stored for extended periods of time it is recommended that the batteries be disconnected, unless a TCMS Charge Wizard® is attached to the TCMS interface. Reconnect battery once a month to maintain a full charge.

9200 - The full rated load is available for load, battery charging or both. When functioning as a regulated battery charger the converter has a nominal voltage output of 13.6 VDC for 12 volt models and 27.2 VDC for 24 volt models. The system is designed to sense voltage on the battery and automatically selects one of three operating modes (normal, boost and storage) to provide the correct charge level to the batteries.

BOOST MODE: If the converter senses that the battery voltage has dropped below a preset level the output voltage is increased to approximately 14.4 VDC (28.8 VDC for 24 volt models) to rapidly recharge the battery.

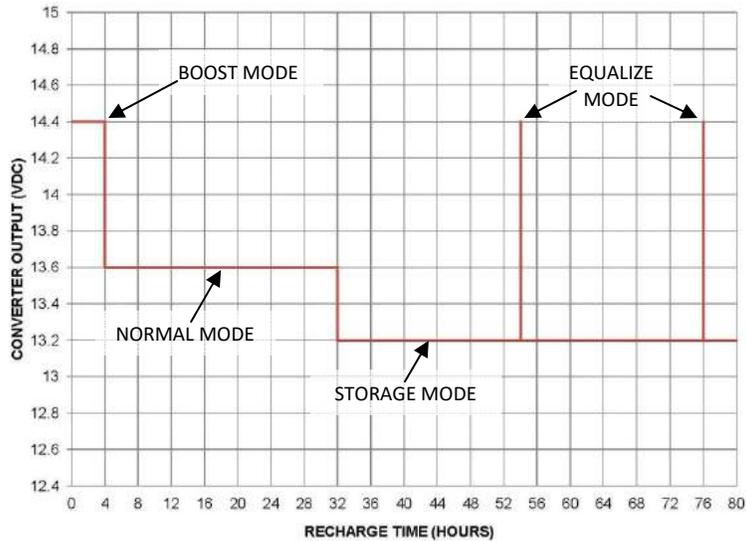
NORMAL MODE: Output voltage set at approximately 13.6 VDC (27.2 VDC for 24 volt models).

STORAGE MODE: When the converter senses that there has been no significant battery usage for 30 hours the output voltage is reduced to 13.2 VDC (26.4 VDC for 24 volt models) for minimal water usage. When in storage mode the microprocessor automatically increases the output voltage to 14.4 VDC (28.8 DC for 24 volt models) for approximately 15 minutes every 21 hours to help prevent sulfation of the battery plates.

CAUTION

IT IS IMPORTANT THAT THE FLUID LEVEL OF ANY CONNECTED BATTERIES BE CHECKED ON A REGULAR BASIS. ALL BATTERIES WILL "GAS" AND LOSE SOME FLUIDS WHEN CONTINUOUSLY CONNECTED TO ANY CHARGING SOURCE

CHARGE WIZARD® ... The INTELI-POWER 9200 series converters have the Charge Wizard® controlled charging module built in. The Charge Wizard® is a microprocessor-controlled device incorporated in Progressive Dynamics 9200 Series INTELI-POWER converters which constantly monitors the battery, and automatically adjusts the converter output voltage based on its charge status. The Charge Wizard® has four (4) operating modes (BOOST, NORMAL, STORAGE and EQUALIZE). Each mode is automatically selected by the Charge Wizard® and ensures a fast yet safe recharge for your battery. See chart below for details.



NOTE: Converter output voltages are 2x the values listed in above table for 24 volt models.

Boost Mode (14.4V for 12V models and 28.8V for 24V models) - Boost mode is to rapidly recharge a battery up to 90% of full charge. Required 8 hours to return the battery to 90% of full charge and approximately 11 hours to reach full charge.**

Normal Mode (13.6V for 12V models and 27.2V for 24V models) - Normal mode is to safely complete the charge of a battery. Required 40 hours to return the battery to 90% of full charge and approximately 78 hours to reach full charge.**

Storage Mode (13.2V for 12V models and 26.4V for 24V models) – Storage mode is to maintain a batteries charge as well as help prevent battery stratification and sulfation. Required 60 hours to return the battery to 90% of full charge and approximately 100 hours to reach full charge.**

Equalize Mode (14.4V for 12V models and 28.8V for 24V models) - The Charge Wizard® will automatically switch to equalize mode for approximately 15 minutes every 21 hours the converter remains in storage mode. This will help prevent battery stratification, sulfation and loss of battery capacity (useful life).

** Times based on a PD9155 recharging a 125AH battery that has been discharged to 10.5V.

- All times and voltages provided above are approximate. -

The integrated Charge Wizard's ability to change the output voltage of the converter will significantly reduce the amount of time it takes to recharge your battery. The lower voltage for Storage mode helps prevents gassing and reduces water loss during long-term storage.

OPTIONAL REMOTE PENDANT

Your INTELI-POWER 9200 converter may have been supplied with a **Remote Pendant**. The **Remote Pendant** is optional on OEM but is included with all retail models and plugs in to the accessory port of the 9200 series converter. While the built-in Charge Wizard® automatically determines which operating mode is best suited to recharge or maintain optimum battery condition, the **Remote Pendant** allows for manual override and has an indicator light to indicate the mode of operation.

BOOST MODE - Indicated by green LED remaining on.

NORMAL MODE - When the battery is between 50% and 90% charged, the green LED will flash once per second. When the battery has reached 90% of full charge the green LED will flash 2 - 3 times per second.

STORAGE MODE - Indicated by green LED flashing every 6 - 8 seconds.

MANUAL BUTTON - The manual button has been provided to allow the operator to temporarily override the converter (not recommended) or to verify the converter is operating properly. For manual operation, press and hold the button. The indicator light will soon remain "ON" indicating Boost Mode. Continue to hold the button and the light will blink rapidly indicating the converter is in the Normal Mode. Continue to hold the button until the light blinks slowly indicating the converter is now in the Storage Mode. After the manual button is released the converter will stay in the selected mode. When the battery charge status changes, the converter will return to the automatic mode of operation to prevent damage to the battery.

If a REMOTE PENDANT was not provided with your INTELI-POWER 9200 Series converter, you can purchase one from your local RV dealer or online at www.progressivedyn.com

OPTIONAL TCMS CHARGE WIZARD

Your INTELI-POWER 9100 converter is equipped with a TCMS interface. The TCMS Charge Wizard pendant plugs into the TCMS interface to provide computer control and monitoring of your batteries charge state. The Charge Wizard® automatically determines which operating mode is best suited to recharge or maintain optimum battery condition. The Charge Wizard® Pendant allows for manual override and has an indicator light to indicate the mode of operation.

BOOST MODE - Indicated by green LED remaining on.

NORMAL MODE - When the battery is between 50% and 90% charged, the green LED will flash once per second. When the battery has reached 90% of full charge the green LED will flash 2 - 3 times per second.

STORAGE MODE - Indicated by green LED flashing every 6 - 8 seconds.

MANUAL BUTTON - The manual button has been provided to allow the operator to temporarily override the converter (not recommended) or to verify the converter is operating properly. For manual operation, press and hold the button. The indicator light will soon remain "ON" indicating Boost Mode. Continue to hold the button and the light will blink rapidly indicating the converter is in the Normal Mode. Continue to hold the button until the light blinks slowly indicating the converter is now in the Storage Mode. After the manual button is released the converter will stay in the selected mode. When the battery charge status changes, the converter will return to the automatic mode of operation to prevent damage to the battery.

The TCMS Charge Wizard Pendant can be purchased from your local RV dealer or online at www.progressivedyn.com

OPTIONAL REMOTE SHUTDOWN MODULE

Your INTELI-POWER 9100L converter is equipped with a Remote Shutdown Module interface. The converter can be shutdown using either a high or low side control, or by connecting two wires by means of a mechanical switch or relay contacts. This allows the battery management system to shutdown the converter after battery charging and balancing are complete.

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES	ACTION
1. No Output	Proper AC power not connected	Connect power supply
		Check AC distribution panel for proper operation
	External Fuses Blown	Check for reverse polarity
		Replace fuses with same type and rating
	Short Circuit	Trace circuits for possible fault
	Unit has shutdown due to overheating	Check air flow
		Allow unit to cool
	Unit has shutdown due to over voltage (Also see Item 4 below) (No over voltage protection for 230V units)	Check input voltage
Converter will shut down if the input voltage exceeds 132 Volts		
Correct input voltage		
Optional remote shutdown module is active. (PD9100L only)	Remove remote shutdown module.	
2. External Fuses Blown	Reverse Battery Hook Up	Correct hook up and replace fuses with same type and rating
3. Low Output	Excessive load for converter	Reduce load requirements or install larger converter
	Input voltage not between 105-130 VAC (205-265 VAC for 230V units)	Correct input supply voltage
	Bad battery cell(s)	Replace battery
4. Intermittent or no Output on Generator, works on Shore Power	Unit has shutdown due to over voltage.	Add another load to the generator, this may reduce the "spikes" to an acceptable level
	Some generators exhibit excessive voltage spikes on the AC power output, this may cause the over voltage protection to shut the unit down	Contact generator manufacturer for possible defect in the generator
	Remote Shutdown Module does not have stable voltage.	Confirm Remote Shutdown Module voltage is between 5 and 30 VDC

Do not replace the converter unless the following checks have been performed:

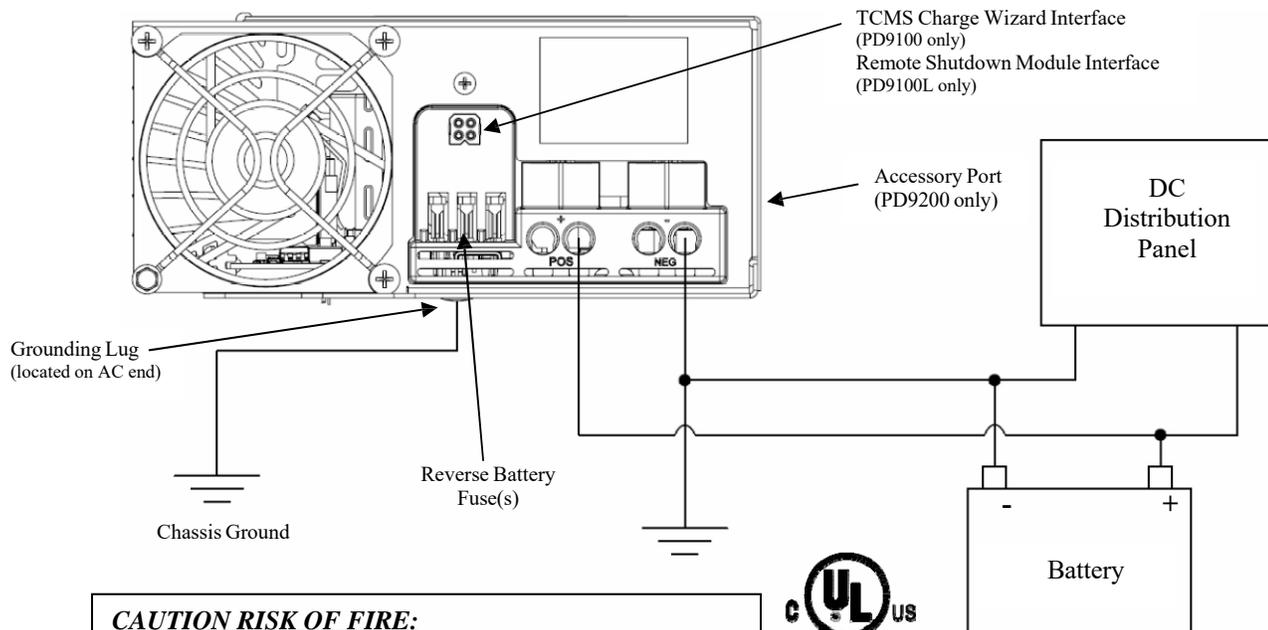
1. Loosen the screw on the positive terminal and disconnect the positive wire. Read the converter output voltage using a DC voltmeter. The power converter is working properly if the voltage is above 13VDC (12V models), 26VDC (24V models), 14.3VDC (12V 9100L models), and 28.4VDC (24V 9100-24L models).
2. If the converter output is zero volts, use an AC voltmeter to check for proper voltage at the 120VAC outlet that the converter is plugged into. This voltage should be between 105 and 130 volts (206 and 265 volts for 230V models).
3. Check the fuses located at the front of the converter. These fuses will only blow if the battery or DC output leads were connected in reverse, even for a moment. Replace the fuses and repeat step 1.
4. Disconnect optional Remote Pendant, TCMS Charge Wizard, or Remote Shutdown Module. Read the converter output voltage using a DC voltmeter. The power converter is working properly if the voltage is above 13VDC (12V models), 26VDC (24V models), 14.3VDC (12V 9100L models), and 28.4VDC (24V 9100-24L models).

NOTES:

- When replacing fuse(s) it may be necessary to remove the TCMS plug or lithium shutdown module (if so equipped) to provide clearance for fuse replacement.
- Disconnect all power sources before replacing fuses.

INPUT/OUTPUT SPECIFICATIONS
(Specifications subject to change without notice)

<p align="center">PD9130(L)</p> <p>Input: 105-130 VAC 60 Hz 500 Watts Output: 13.6 VDC, 30 Amps (9130L) – 14.6 VDC, 30 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs</p>	<p align="center">PD9140(L)</p> <p>Input: 105-130 VAC 60 Hz 600 Watts Output: 13.6 VDC, 40 Amps (9140L) – 14.6 VDC, 40 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs</p>	<p align="center">PD9_45(L)</p> <p>Input: 105-130 VAC 60 Hz 725 Watts Output: 13.6 VDC, 45 Amps (9145L) – 14.6 VDC, 45 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs</p>
<p align="center">PD9_60(L)</p> <p>Input: 105-130 VAC 60 Hz 1000 Watts Output: 13.6 VDC, 60 Amps (9160L) – 14.6 VDC, 60 Amps Dimensions: 3.6H x 8L x 9W Weight: 5.8lbs</p>	<p align="center">PD9_70(L)</p> <p>Input: 105-130 VAC 60 Hz 1250 Watts Output: 13.6 VDC, 70 Amps (9170L) – 14.6 VDC, 70 Amps Dimensions: 3.6H x 8L x 9W Weight: 5.8lbs</p>	<p align="center">PD9_80A(L)</p> <p>Input: 105-130 VAC 60 Hz 1300 Watts Output: 13.6 VDC, 80 Amps (9180AL) – 14.6 VDC, 80 Amps Dimensions: 3.6H x 8L x 9W Weight: 6.0lbs</p>
<p align="center">PD9_25-24(L)</p> <p>Input: 105-130 VAC 60 Hz 775 Watts Output: 27.2 VDC, 25 Amps (9125-24L) – 29.2 VDC, 25 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs</p>	<p align="center">PD9_40-24A(L)</p> <p>Input: 105-130 VAC 60 Hz 1300 Watts Output: 27.2 VDC, 40 Amps (9140-24AL) – 29.2 VDC, 40 Amps Dimensions: 3.6H x 8L x 9W Weight: 6.0lbs</p>	<p align="center">PD9260-230</p> <p>Input: 205-265 VAC 50/60 Hz 1000 Watts Output: 13.6 VDC, 60 Amps Dimensions: 3.6H x 8L x 9W Weight: 5.8lbs NOT UL OR CUL LISTED</p>



CAUTION RISK OF FIRE:

Chassis bonding wire must be a separate wire ran directly from the grounding lug provided on the converter. **DO NOT** connect output negative to chassis using the same wire.

