



AC to DC Converter/Charger

AC to DC CONVERTER/CHARGER

**PM3 model 18 Amp 48 Volt
with 3 Stage Charging Option**

Installation & Maintenance



SAFETY ALERT

FOR YOUR SAFETY, READ ALL INSTRUCTIONS BEFORE INSTALLATION AND OPERATION.

INSTALLER: Provide these instructions to the end user or consumer.

CONSUMER: Keep these instructions for future reference.

NOTICE: Products are not to be used nor are warranted in aerospace, medical or life safety applications.



WARNING – Avoid Possible Injury or Death

120 VAC is present. This Converter/Charger is designed to convert **120 VAC** to **48 VDC**. It also provides power for charging a **48V battery assembly (90Ah minimum capacity)**. This Converter/Charger is a "switch mode" type and is designed to be maintenance-free with no user serviceable components. The Converter/Charger power output is "current limiting" by design.



WARNING – Avoid Personal Injury or Product Damage

NEVER store electrical devices in compartments where flammable liquids (such as gasoline) exist.
DO NOT mount/install unit in compartments designed for storage of batteries or flammable liquids.

1. **DISCONNECT VEHICLE/DEVICE DC POWER.** Disconnect the vehicle/device battery POS (+) wire at the battery end before connecting this Converter/Charger to any vehicle/device wiring.
2. **LOCATION.** The mounting location may be on any interior (out of direct weather) surface. Location chosen must be accessible after installation. When mounted inside a cabinet, the cabinet must be large enough to allow dissipation of heated air. Make sure that there is a minimum of 1" (one inch) free air space at each end of the unit so that cooling air can move through the unit properly. AVOID foreign contaminants such as dirt, metal particles or moisture.
3. **MOUNTING.** Flanges with holes are provided for ease of mounting using standard fasteners. Confirm that the surface that the converter is mounted to is solid and will hold the weight (9 lbs) during vehicle operation.
4. **ELECTRICAL REQUIREMENTS.** A **120 VAC** receptacle needs to be located within 36 inches of the Converter/Charger to supply power. Electrical consideration should also be given to mounting near the locations of the batteries and the **48 VDC** distribution panel.
5. **ELECTRICAL CONNECTIONS.** Be sure to tighten all connections securely. A loose connection can quickly cause terminals and wires to overheat. Review unit labels for recommended terminal torque values.



WARNING – Avoid Possible Injury or Death

120 VAC Connection – First confirm that the **120 VAC** power source AC circuit breaker(s) are in the Off position. **DO NOT** turn-on AC circuit breakers until installation is complete.

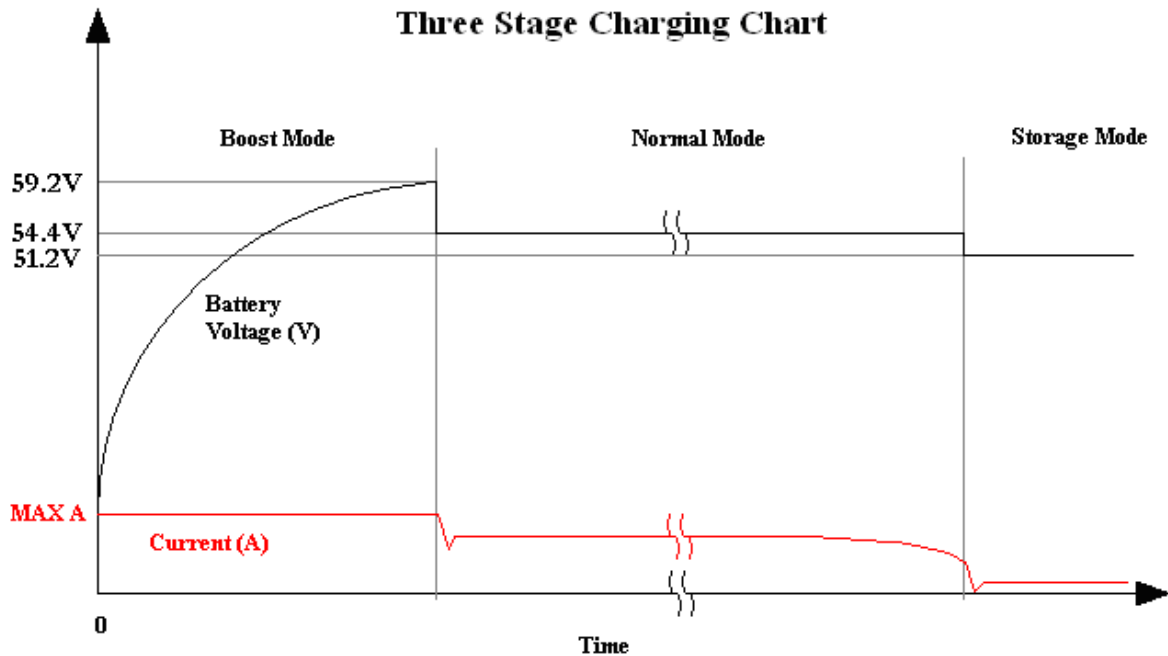
- Using a 16 AWG minimum size copper wire, attach from the vehicle/device chassis to the Converter/Charger Bonding Lug.
- Using the attached power cord on the Converter/Charger, connect firmly to the **120 VAC** receptacle



48 VDC Wiring– It is important to use the correct wire gauge. Use a minimum of 16 AWG size copper wire.

- The terminal marked **+** or **POS** is for the vehicle/device **48 VDC positive** connection.
- The terminal marked **-** or **NEG** is for the vehicle/device **48 VDC negative** connection.
- The **48 VDC** output wiring does not require over-current protection because the Converter/ Charger limits current output. However, all electrical connections need to comply with the appropriate NEC code.

6. **3 STAGE CHARGING OPTION DESCRIPTION.** This system provides an automatic charging system in three steps. 1. A fast charge to bring a good, drained battery back up to full voltage rapidly ("Boost"). 2. A standard charge to bring the battery up to a full charge at a safe rate to prolong the life of the battery and provide power to other 48V on-board devices ("Normal"). 3. A trickle charge to keep the battery fresh during times of load inactivity ("Storage"). The charger automatically changes modes to accommodate changes in conditions. The chart below is for reference only, voltages may vary slightly.



7. **TEST.** First, disconnect all loads and battery on the Converter/Charger by removing all **48 VDC** connections from **+** or **POS**. Second, attach a multimeter instrument between the positive and negative terminals of the Converter/Charger. Then energize the **120 VAC** Converter/Charger circuit. Test for proper output power using the multimeter. Measure the output voltage from the positive and negative terminals. The voltage should read **54.4 +/- 0.1 VDC**. Add **48 VDC** load connections to draw about **12 Amps** from the Converter/Charger. Recheck the voltage, which should remain approximately the same as at no load.
8. **BATTERY.** With the **120 VAC** disconnected, reconnect the **+** or **POS** positive terminal to a known good battery. With the converter **120 VAC** energized, measure the voltage at the converter and at the battery. The voltage should be about the same in both locations. As with any battery it is important that the fluid level be checked on a regular basis. When continuously connected to any charging source all batteries will "Gas" and lose some fluid.

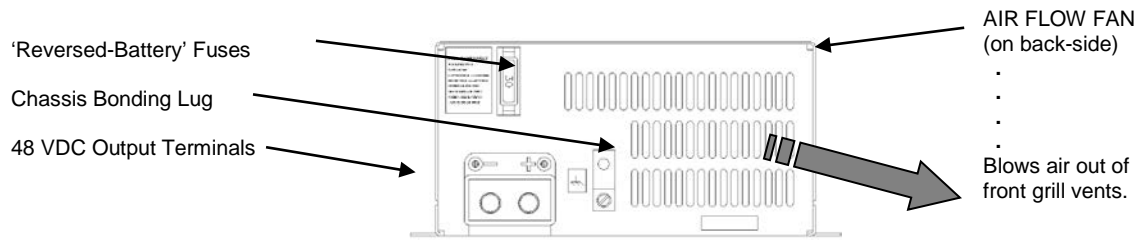


WARNING – Avoid Personal Injury / Product Damage

9. **HI-POT TESTING.** (Vehicle/device Manufacturing Facilities Only) **DO NOT** Hi-Pot DC wiring with the Converter/Charger connected to the vehicle/device wiring in order to prevent serious injury and/or damage.



TROUBLESHOOTING



NOTE: Before removing and replacing the Converter/charger, perform the following checks:

- Disconnect the AC power from the vehicle/device.
- Disconnect the wiring and Battery from the Converter Positive **+** output terminal.
- Re-connect the AC power to energize the Converter.
- Using a voltmeter, measure the voltage at the Converter **-** and **+** Output terminals.
 - > The Converter/Charger is OK if the voltage reading is between 54 VDC and 55 VDC (typically 54.4 VDC).
 - > Otherwise check the table below:

CONDITION	POSSIBLE CAUSE
No 48 VDC output	<ul style="list-style-type: none"> 120 VAC not connected to coach or the coach AC circuit breaker is in the Off position. Reversed battery fuses blown. (Battery wiring connections are reversed), Severe overload or shorted load. Remove all loads and retest per above instructions. Converter/Charger internal failure.
Converter cycles On & Off	<ul style="list-style-type: none"> Fan air flow is inadequate or blocked. (1" minimum free air space at each end required) Converter/Charger internal failure.
Reversed Battery fuses blown	<ul style="list-style-type: none"> Battery wiring connections are reversed. Defective battery, possible bad cells.
48 VDC output is too low	<ul style="list-style-type: none"> Attached load exceeds rating of the Converter/Charger. Defective battery, possible bad cells. Converter/Charger internal failure.

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