



AC to DC CONVERTER/CHARGER

PM3 model 20, 25, 30, 40 and 50 Amp
24 Volt with 3 Stage Charging Option

Installation & Maintenance

AC to DC Converter/Charger



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 **24 VDC**. It also provides power for charging a **24V 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 **24 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.
6. **THE FAN WILL NOT RUN ALL THE TIME. THE FAN RUNS ONLY WHEN NEEDED.**
7. Never Leave the PowerMax PM3-XX unattended when plugged in.
8. All PM3 Products must be installed by a certified electrician.



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.

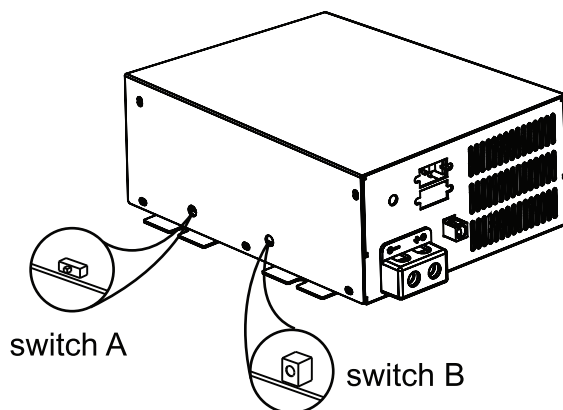
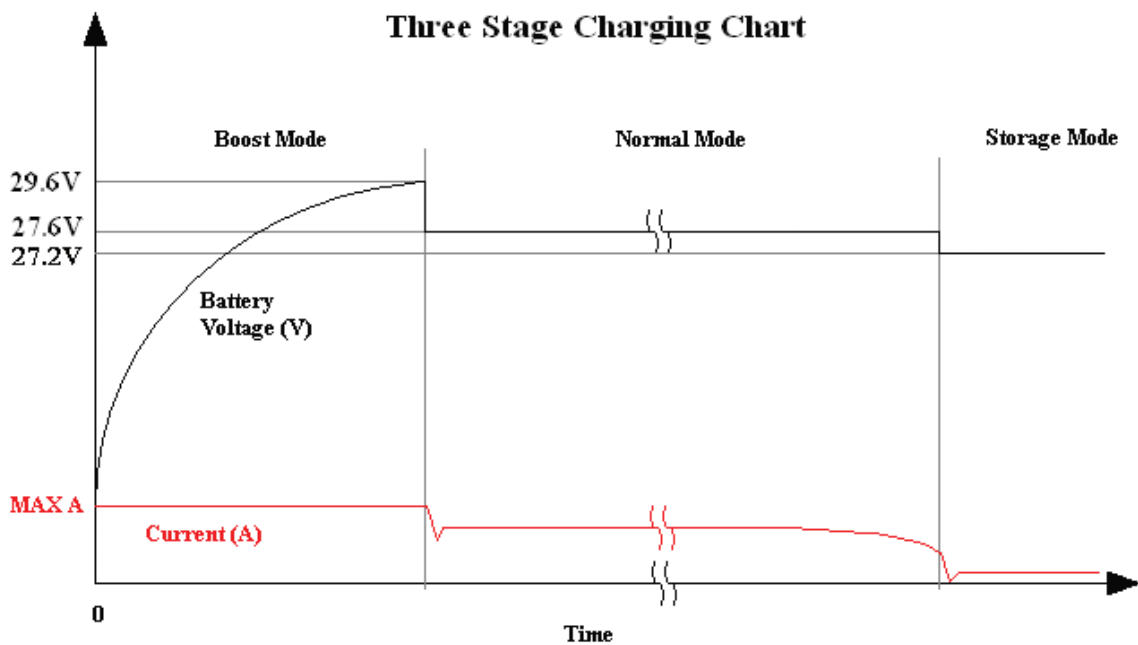
- . Using 10 AWG minimum size copper wire, attach from the vehicle/device chassis to the Converter/Charger Grounding Lug.
- . Using the attached power cord on the Converter/Charger, connect firmly to the **120 VAC** receptacle



24 VDC Wiring– It is important to use the correct wire gauge. Use a minimum of 10 AWG size copper wire.

- The terminal marked $\boxed{+}$ or **POS** is for the vehicle/device **24 VDC positive** connection.
- The terminal marked $\boxed{-}$ or **NEG** is for the vehicle/device **24 VDC negative** connection.
- The **24 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.

7. **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 24V 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.



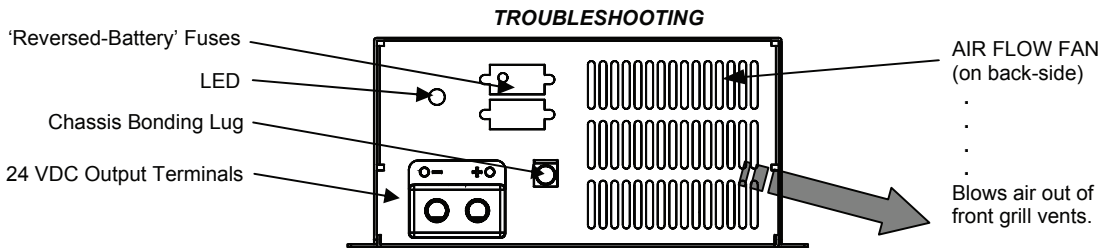
8. ADJUST FIXED VOLTAGE

DESCRIPTION: The unit is on the three stage charging mode firstly. 1. move the switch A to "Adjust Fixed Voltage", move switch B gently to adjust voltage from 26~33V, and get a fixed output voltage. 2. make sure the voltage as 29.2V, move the switch A to " Three stage charging", then the unit back to standard "Three Stage Charging", run 29.2V almost 0.5 hour, 27.2V almost 12 hours and then to 26.4V. The voltage value of 3 stage charging will be changed with fixed voltage changed when the unit on "Three stage charging".



9. TEST. First, disconnect all loads and battery on the Converter/Charger by removing all 24 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 27.6 +/- 0.1 VDC. Add 24 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.

10. 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.



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

- a. Disconnect the AC power from the vehicle/device.
- b. Disconnect the wiring and Battery from the Converter Positive (+) output terminal.
- c. Re-connect the AC power to energize the Converter.
- d. Using a voltmeter, measure the voltage at the Converter (-) and (+) Output terminals.
 - > The Converter/Charger is OK if the voltage reading is between 27 VDC and 28 VDC (typically 27.6 VDC).
 - > Otherwise check the table below:

CONDITION	POSSIBLE CAUSE
No 24 VDC output	<ul style="list-style-type: none"> . 120 VAC not connected to coach or the coach AC circuit breaker is in the <u>off</u> 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.
24 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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