



## Diversified Power International

414 Century Court; Piney Flats, TN 37686  
Phone: (423) 538-9002, (800) 334-5091 Fax: (423) 538-9202

[www.DPIpower.com](http://www.DPIpower.com)

P/N: MNL024 - REV.4

### **IMPORTANT SAFETY INSTRUCTIONS: THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS FOR YOUR BATTERY CHARGER. KEEP IT WITH OR NEAR CHARGER AT ALL TIMES.**

#### **1. WARNING - RISK OF EXPLOSIVE GASES.**

**WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. IT IS IMPORTANT THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW INSTRUCTIONS EXACTLY.**

- 1.1 To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary markings on these products and on engine.
- 1.2 Do not expose charger to rain, snow, or liquids.
- 1.3 Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
- 1.4 To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning.
- 1.5 An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure that the pins on the plug of the extension cord are the same number, size and shape as those of the plug on the charger and that the extension cord is properly wired and in good electrical condition and that the wire size is 18 AWG minimum.
- 1.6 If charger is equipped with an input power cord, do not operate charger with a damaged cord or plug - replace the cord or plug immediately.
- 1.7 Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified repair service center.
- 1.8 Do not disassemble charger; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

#### **2. PERSONAL PRECAUTIONS**

- 2.1 Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. Wear complete eye and clothing protection. Avoid touching eyes while working near battery.

- 2.2 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flush eye with running cold water for at least 10 minutes and get medical attention immediately.
- 2.3 **NEVER** smoke or allow a spark or flame in vicinity of battery or engine.
- 2.4 Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause an explosion.
- 2.5 When working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watches, etc. A lead-acid battery can produce a short-circuit current high enough to weld a ring, or the like, to metal, causing a severe burn.
- 2.6 **Use charger for charging a Lead-Acid Battery only.** It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst causing injury to persons and damage to property.
- 2.7 **NEVER** charge a frozen battery.

#### **3. PREPARING TO CHARGE**

- 3.1 If necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc. Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material, as a fan.
- 3.2 Clean battery terminals. Be careful to keep corrosion from coming into contact with eyes. Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without caps, carefully follow manufacturer's recharging instructions.
- 3.3 Study all battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- 3.4 Determine voltage of battery by contacting battery manufacturer and make sure it matches output rating of battery charger.

#### **4. CHARGER LOCATION**

- 4.1 Locate charger as far away from battery as DC output cables permit.

- 4.2 Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- 4.3 Never allow battery acid to drip onto charger when taking specific gravity readings or filling battery.
- 4.4 Do not operate charger in a closed-in area or restrict ventilation in any way.
- 4.5 Do not set a battery on top of charger.
- 4.6 This unit is intended to be correctly orientated in a vertical or floor mounted position.

**5. DC CONNECTION PRECAUTIONS**

- 5.1 Connect and disconnect DC output terminals only after removing charger from AC outlet.
- 5.2 Never allow DC output terminals to touch each other.
- 5.3 If problems arise connecting the output leads, solicit the aid of your Dealer, from whom you purchased this product, or the charger manufacturer for finding a suitable connection device for your application.

**6. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF SPARK NEAR BATTERY:**

- 6.1 Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
- 6.2 Stay clear of fan blades, belts, pulleys, and any other parts that can cause injury to persons.
- 6.3 Check polarity of battery posts. **POSITIVE (POS.,P,+)** post usually has a larger diameter than the **NEGATIVE (NEG.,N,-)** post.
- 6.4 Determine which post of battery is grounded (connected) to chassis. If negative post is grounded (as in most vehicles), see paragraph 6.5. If positive post is grounded, see paragraph 6.6.
- 6.5 For negative-grounded vehicle, first connect **POSITIVE (RED)** clip from charger to **POSITIVE (POS.,P,+)** ungrounded post of battery. Then connect **NEGATIVE (BLACK)** clip to vehicle chassis or engine block away from battery.
- 6.6 For positive-grounded vehicle, connect **NEGATIVE (BLACK)** clip from charger to **NEGATIVE (NEG.,N,-)** ungrounded post of battery. Connect **POSITIVE (RED)** clip to vehicle chassis or engine block away from battery.
- 6.7 Do not connect any charger clips to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
- 6.8 When disconnecting charger, turn switches (if supplied) to off, disconnect charger from AC power, remove clip from vehicle chassis, and then remove clip from battery terminal. Refer to Section 8 - Operating Instructions for charge time information.

**7. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF SPARK NEAR BATTERY:**

- 7.1 Check polarity of battery posts. **POSITIVE (POS.,P,+)** battery post usually has a larger diameter than **NEGATIVE (NEG.,N,-)** post. Some batteries are equipped with 'Wing-Nut' terminals allowing for easy placement of the terminals to these posts.
- 7.2 Attach at least a 24-inch long 16-gauge (AWG) insulated battery cable to **NEGATIVE (NEG.,N,-)** battery post.
- 7.3 Connect **POSITIVE (RED)** charger terminal to **POSITIVE**

**(POS.,P,+)** post of battery.

- 7.4 Position yourself and free end of cable as far away from battery as possible. Then connect **NEGATIVE (BLACK)** terminal to free end of cable.
- 7.5 Do not face battery when making final connection.
- 7.6 When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- 7.7 A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

**8. OPERATING INSTRUCTIONS**

**8.1 L.E.D. DISPLAY:**

Red	A.C.POWER	On	when	A.C.	Power	is	connected
Yellow	CHARGING	On	or	Flashing	when	charging	battery
Green	FLOAT / Maint.	On	when	battery	finished	charging	

**NOTE:** If the Red L.E.D. flashes, **OR** if the Yellow and Green L.E.D.s flash **ALTERNATELY** back and forth, then a Charge Error Condition has occurred - refer to **Section 9**.

**8.2 CHARGING A 12V BATTERY:**

After connection to A.C. power and battery, the charger starts its 5-Stage Charging Process, as described, in the following order:

**STAGE ONE: PRE-QUALIFICATION TEST (Battery Testing)**

Yellow L.E.D. Flashes for normally 45 seconds. If Reverse Battery Connections, wrong battery connected (24v battery etc), or batteries with shorted cells are found, further testing stops and the Red L.E.D. will flash - refer to **Section 9**.

**STAGE TWO: BULK-CHARGE CHARGING**

Yellow L.E.D. illuminates continuously indicating that the charger is charging the battery at the full rated amps output. This stage ends when the battery voltage reaches 14.4Vdc.

**STAGE THREE: EQUALIZATION-CHARGE CHARGING**

Yellow L.E.D. illuminates continuously and regulates battery voltage to approximately 14.4Vdc till battery reaches full charge.

**STAGE FOUR: FLOAT / MAINTENANCE**

Green L.E.D. illuminates continuously. Charging is complete. The charger maintains the battery at full charge by regulating the battery's voltage to approximately 13.2Vdc.

**STAGE FIVE: RECYCLED CHARGE**

This stage is an extension of Stage 4 and monitors the battery. If a load (lamp or radio, etc) is applied to the battery, OR if a minimum of 28 days elapses, the charger resets itself, automatically, and begins a new charge cycle, starting from Stage One.

**WARNING:** During charging or while maintaining battery, periodically (at least daily) check on your charging system (just as you would with any electrical appliance). Adverse A.C. Line Power surges, dips, and/or other conditions, may affect the charger and require your attention.

**8.3 'BATTERY TYPE' SELECT SWITCH (If installed):**

If supplied, the switch will be mounted on either the Back or Front End of the charger. The setting of this switch, allows

for different types of batteries to be charged as described:

- 1 '6V' or '6V REG': Use for charging 6V Lead Acid Battery
- 2 '12V' or '12V REG': Use for charging 12V Lead Acid Battery
- 3 '12V AGM': Use for charging 12V AGM type or smaller than 20AH capacity Lead Acid Battery

Whenever the '6V' or '6V REG' selection is selected, charging will occur just as described in **Section 8.2**; except, where voltage is specified. Voltage levels and regulation specifications change to half of that specified for the '12V' or '12V REG' setting.

If a 12v battery is connected to a 6v Setting, the charger will indicate a failure immediately. However, if a 6v battery is connected to a 12v setting, hours will pass before the charger indicates a charge failure.

## 9. CHARGE ERROR AND OTHER PROTECTION DEVICES

### 9.1 TIME DEPENDENT CHARGING

**CHARGE ERROR** Under a Charge Error Condition, either (1) the Red L.E.D. will flash OR (2) the Yellow and Green L.E.D.s will flash ALTERNATELY. Charging is also stopped. The internal microprocessor monitors all stages of charging and makes note of any unusual conditions such as: Reverse Battery Connections, 12v Battery connected when charger selected for charging 6v battery, excessive charge time, very deeply discharged batteries and other conditions.

A factory programmed Safety Timer, is started when charging starts and ample time has been allotted to complete the charge. When charge time exceeds the Safety Timer, the microprocessor makes a decision to either force the charger into Stage 4 or, if the battery voltage was not high enough, shut down charging and display a Charge Error. Charge time increases due to battery aging, automotive lights or other connected loads

If connections to the battery are reversed, unplug charger and remake connections.

### 9.2 OVERLOAD CONDITION.

The charger employs the use of circuit protectors designed to open under catastrophic events such as acts of nature, etc.

## 10. MAINTENANCE

Store in a clean, dry place. Occasionally clean the case and cords (while the charger is unplugged), with a slightly damp cloth.

in material or workmanship. In order for a claim to be processed the product must be returned to DPI (i) with all transportation charges prepaid, (ii) accompanied by a acceptable proof of purchase, and with a Return Material Authorization (RMA) number, previously obtained from DPI, printed and clearly visible on the outside of the shipping container. This warranty does not apply if the product has been modified, abused, or damaged or improperly or negligently used, connected, maintained, or operated in any manner contrary to the instructions stated in this manual or affixed to the product's enclosure. Repair or replacement as provided under this warranty is the exclusive remedy of the purchaser, and the purchaser shall have no claim against DPI except for the breach of an express warranty stated herein. DPI shall not be liable for any incidental, consequential, or special damages for breach of any expressed or implied warranty. Except to the extent required by applicable law any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the **first three (3) years** after the date of purchase. Some states do not allow the exclusion or limitation of incidental or consequential damages or allow limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state. APART FROM THE WARRANTIES SET FORTH ABOVE, DPI MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE SUITABILITY OR MERCHANTABILITY OF THIS PRODUCT, THE FITNESS OF THIS PRODUCT FOR ANY SPECIFIC USE OR PURPOSE, OR ANY OTHER MATTER PERTAINING TO THIS PRODUCT.

Return information:  
DIVERSIFIED POWER INTERNATIONAL LLC  
414 CENTURY COURT, PINEY FLATS, TN 37686, U.S.A.  
RMA # \_\_\_\_\_

For further information, product updates, technical information, or general inquiries, also, please visit our web site at:

[www.DPIpower.com](http://www.DPIpower.com)

## 11. LIMITED WARRANTY

Diversified Power International LLC (DPI) warrants exclusively to the original purchaser that this product will be replaced or repaired, at DPI's option, if it fails during the **first three (3) years** after date of purchase due to a defect