

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT: READ AND SAVE THIS SAFETY AND INSTRUCTION MANUAL. KEEP IT WITH OR NEAR CHARGER AT ALL TIMES.

SPECIFICATIONS: For technical assistance, call your Dealer with the model and s/n listed on the topside of the charger

WARNING – RISK OF EXPLOSIVE GASES

WORKING IN THE 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 MAKE CERTAIN YOU FULLY UNDERSTAND IT AND FOLLOW THE SAFETY AND OPERATING INSTRUCTIONS EXACTLY.

1. To reduce risk of battery explosion, follow all safety instructions below and those published by the battery manufacturer and review cautionary markings on equipment containing the battery.
2. **CAUTION:** To reduce the risk of injury, charge only rechargeable **LEAD-ACID** batteries. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst causing personal injury and property damage. If uncertain about battery type or charging procedure, contact the battery manufacturer. The charger is not intended to supply power to low-voltage electrical systems other than applications using rechargeable lead-acid batteries.
3. Use of an attachment not recommended or sold by the battery charger manufacturer may result in risk of fire, electric shock, or injury to persons.
4. Do not operate or disassemble charger if it has received a sharp blow, been dropped, or otherwise damaged in any way.
5. Charger contains no serviceable parts. If it fails during its warranty period, contact your Dealer for a warranty replacement.
6. To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning.
7. Do not expose charger to rain, snow, liquid, or moisture.

PERSONAL PRECAUTIONS

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.
2. Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing, or eyes. Wear eye and clothing protection and avoid touching eyes while working near battery.
3. 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. Seek medical attention immediately.
4. **NEVER** smoke or allow a spark or flame in vicinity of charger.
5. Be extra cautious not to drop a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause an explosion.
6. Before working with 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 such items causing a severe burn.
7. **NEVER** charge a frozen battery – thaw it out first. Charging will then be safer and more efficient.

NEVER USE AN EXTENSION CORD...

But if you have to, it must be a UL and/or CSA approved cord. Connect charger to the cord before plugging cord into a power outlet rated at 120-volts. Use of improper extension cord could result in fire and/or electric shock. Before using extension cord, make sure that it is properly wired and in good electrical condition; and that the wire size is large enough for AC amp rating of charger as specified in the following table:

RECOMMENDED MINIMUM AWG SIZE FOR EXTENSION CORDS FOR BATTERY CHARGERS

Length of cord (feet):	25	50	100	150
AWG size of cord:	18	18	16	14

PREPARING TO CHARGE

1. 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.
2. Clean battery terminals. Be careful to keep corrosion from coming into contact with eyes.
3. 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.
4. Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
5. Determine voltage of battery by contacting battery manufacturer and make sure it matches output rating of battery charger.
6. Do not use this charger for charging or maintaining more than one Lead-Acid battery.

CHARGER LOCATION

1. Locate charger as far away from battery as DC cables permit.
2. Never place charger directly above the battery being charged; gases from battery will corrode and damage charger.
3. Never allow battery acid to drip on charger when reading gravity or filling battery.
4. Do not operate charger in a closed-in area or restrict ventilation in any way.
5. Do not set battery on top of charger.

DC CONNECTION PRECAUTIONS

1. Connect and disconnect DC output terminals only after removing AC plug from AC outlet.
2. Never allow DC output terminals to touch each other.
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.

OPERATING INSTRUCTIONS

Your charger uses a sophisticated charging algorithm that tests the charging process from start to finish as follows:

Stage one: Pre-qualification test

Yellow LED flashes SLOWLY. Duration of test is approximately 1 minute if battery is in good condition. If your battery has been left in a state of discharge for a long period of time (days to months), or your battery voltage is less than 10.5V at the time charging started, then up to 5hrs of testing may be required to determine if the battery will even accept a charge. This length of time is required because the plates have become severely sulfated (similar to iron rusting), and the charger needs the time to properly analyze the battery through the sulfated plates. Plate Sulfation may have become so thick that the low level charging of this stage requires a long time to gently charge the battery cells back up.

Stage two: Constant current charge

Yellow LED on CONTINUOUSLY. Bulk charging at full rated output until battery voltage reaches approximately 14.40V.

Stage three: Constant voltage charge

Yellow LED flashes QUICKLY. This stage is also referred to as the Equalization Charge, since the individual cells inside the battery are forced to become equalized, and is exited when the battery state of charge is near or at 100%

Stage four: Float charge

Green LED on CONTINUOUSLY. Regulation is reduced to a low level to prevent electrolyte evaporation which helps prolong the life of the battery. If an excessive load is applied to the battery, a new charge cycle is initiated, starting with the Constant Current.

Stage five:

Every 84th day, a new charge cycle, starting with the Pre-Qualification stage, restarts to keep the electrolyte mixed.

LED DISPLAY

Upon connection to either AC or battery, all LEDs will flash one to four times to indicate the Mode Setting of the charger. Consult Factory for Mode Setting specifications since the mode is internally set to match the battery size of your application. After count out of the Mode, the LED display will act according to the following table:

- 1st red LED: Illuminates continuously if AC power connected, but flashes once every 6 seconds if disconnected from AC power while still connected to the battery.
- 2nd red LED: Not normally used except in conjunction with the 1st and 3rd red LED, and then only if flashing a Charge Error Code, if in normal charge mode, or used as an indicator in the Bar Graph Voltage Level Display Mode
- 3rd red LED: Illuminates continuously if a battery has not been detected as connected to the output leads.
- Yellow LED: During normal charge mode, it displays the charge Stage Status – either Pre-qualification stage, Bulk, or Equalization stage.
- Green LED: Indicates Full Charge stage when illuminated.

If, during the Normal Charge Mode (meaning not the Voltage Display Mode), the 1st, 2nd, or 3rd solely, or in any combination of each other, **AND** flash in a 'Once per 3 second duration' in unison with a beeping buzzer, the charger is announcing a Failed Charge Cycle per the following table:

FAILURE MODE ERROR TABLE			
	Flashing LEDs		
	1st Red	2nd Red	3rd Red
Wrong Battery Voltage	Off	Off	Flash
Reverse Battery Connection	Off	Flash	Off
Output Over Current	Off	Flash	Flash
Thermal Runaway Condition	Flash	Off	Off
Charge Time Monitor	Flash	Off	Flash
Excessive Battery Drain	Flash	Flash	Off
Failed Pre-Qualification Test	Flash	Flash	Flash

1. DESCRIPTION OF BATTERY FAILURES

WRONG BATTERY VOLTAGE

Example: Charger connected to a 24V battery.

REVERSE BATTERY CONNECTION

Charger connected backwards to battery. Remake connection

OUTPUT OVER CURRENT

Possible cause is a Pump Motor switching on while battery is fully discharged since motors act like a short circuit when first turned on.

THERMAL RUNAWAY CONDITION

Old battery – cells and inside of battery age differently. During charging this error may occur and the battery(s) may have to be replaced.

CHARGE TIME MONITOR

Battery pack took too long to complete its charge. Possible causes include a load (like a pump motor) that operated during charging or the battery pack is too large. Apply the following formula to determine if the Timer may run out due to a large battery:

$$\text{Charge Time} = \frac{\text{Battery Capacity (AH)} \times 1.25}{\text{Charger Output Amps}}$$

Charge time will be in hours and the value must be less than the rated Safety Timer, printed under Specifications. Output Amps and Battery Capacity (AH – ampere-hour) are listed on your battery or contact your battery purchasing source.

Example 1: Charge time to charge a fully discharged 100 AH battery: $100\text{AH}/8\text{Amps} \times 1.25 = 15.6 \text{ Hrs} - \text{ok to use.}$

EXCESSIVE BATTERY DRAIN

Large battery load that depleted battery below 6V. Disconnect load and recharge battery.

FAILED PRE-QUALIFICATION TEST

Highly sulfated battery or possible connection to a 6V battery. The battery(s) may need to be replaced.

2. BAR GRAPH VOLTAGE DISPLAY MODE

If your charger is equipped with a Momentary-On pushbutton option to select this display, then, if depressed, **AND ONLY WHILE HELD DEPRESSED**, and regardless of whether charger is charging, or unplugged from AC power, the LED display resorts to annunciating a 'Voltage Level Bar Graph Display', where the LEDs will flash in a bar graph fashion to indicate the approximate voltage level of the battery connected to the charger – consult the LED label for the Bar Graph Voltage levels.

OTHER WARNINGS AND CAUTIONS

If, when charging two (2) 6V batteries, connected in a series to make a 12V battery, always ensure that each battery is the same size, rating, type, age, and at the same state of charge to avoid excessive gases or release of electrolyte through cracked battery cases. Also, never use the charger for any other purpose. Its use is limited strictly to the charging of Lead-Acid Batteries in accordance with ALL of the conditions set forth in this manual.

MAINTENANCE

Your new charger requires only little maintenance. Mount charger in a clean, dry place and occasionally clean the case and cords (while the charger is unplugged) with a slightly damp cloth.

THREE YEAR LIMITED WARRANTY

Diversified Power International LLC (DPI) offers this NON-TRANSFERABLE, THREE YEAR LIMITED WARRANTY to the original purchaser:

DPI warrants exclusively to the original purchaser that this charger will be replaced or repaired, at DPI's option, if it fails during the first three years after date of purchase to defect in material or workmanship. It is the responsibility of the purchaser to contact DPI Customer Service for warranty consideration.

DIVERSIFIED POWER INTERNATIONAL LLC

(423) 538-9002

www.DPIpower.com

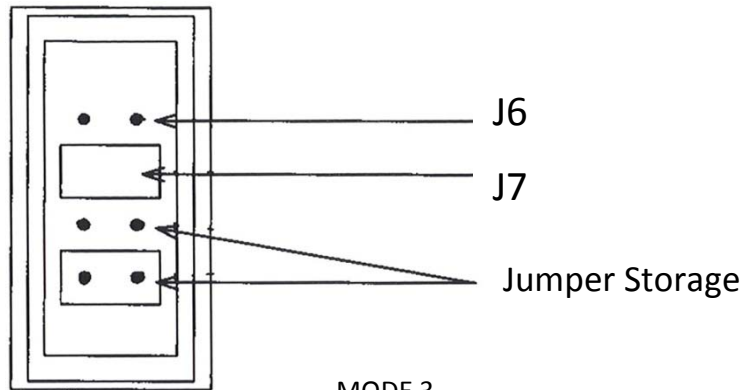
A copy of the original bill of sale is required for the limited warranty to be honored. If a copy of the original bill of sale is lost, a \$14.99 handling fee must accompany the battery charger for the limited warranty to be honored. This warranty does not cover failures arising out of improper use, maintenance or operation of the product. Repair or replacement as provided under this warranty is the exclusive remedy of the consumer. DPI shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty on this product. Except to the extent provided by applicable law, any implied warranty of merchantability or fitness for a particular purpose on this product is limited to the duration of this warranty.

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.

P/N: MNL030-04090

MODE 1
 91-150 amp hours
 No jumpers on J6 & J7

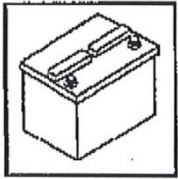
MODE 2
 61-90 amp hours
 Jumpers on J6



Charger P/N #10037418
 Display P/N #10037394

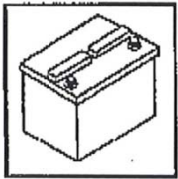
MODE 3
 31-60 amp hours
 Jumpers on J7

MODE 4
 7-30 amp hours
 Jumpers on J6 & J7



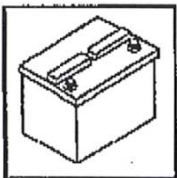
BATTERY CHARGING

Charging must be performed with the charger that is provided and prewired into the machine. During charging, the temperature in the battery must not exceed 120°F. Charging simultaneously with truck operation is not recommended. Plug the charger into a 115V outlet. Charge until the battery gauge indicator lights show fully charged (approximately 6-8 hours)



WARNINGS AND INFORMATION ON BATTERY

Avoid the use of open flame batteries. At temperatures around the freezing point, battery capacity is reduced by 30%. The battery terminals, connections and wiring should be clean and free of corrosion. When cleaning any of these components wear a face shield or other suitable protective eyewear. Read, understand and follow all battery and battery charger manufacturer's specific precautions while working with and/or charging batteries. The battery used in this machine is an AGM (Absorbed Glass Mat) type and allows safe trouble-free performance. There is no need to add electrolyte. No special handling is required and it is classified as non-hazardous.



BATTERY MAINTENANCE

To measure the voltage, use a voltmeter (DC) on the battery poles. The truck must not have been in use for the previous 30 minutes.



Approx. 12.7V	Fully Charged
Approx. 12.2V	½ Charged
Approx 12.0V	¼ Charged
Approx 11.6V	Discharged

BATTERY INFORMATION CENTER

DEPRESS AND HOLD BUTTON
FOR BATTERY FUEL INDICATION

RELEASE BUTTON FOR
CHARGER STATUS INDICATION

BATTERY FUEL

CHARGER STATUS

100 %



CHARGED

80 %



CHARGING

60 %



BATT. DISCONNECT

40 %



SHUTDOWN

20 %



A.C. ON

CAPACITY

A.C. DISCONNECTED
WHEN FLASHING