



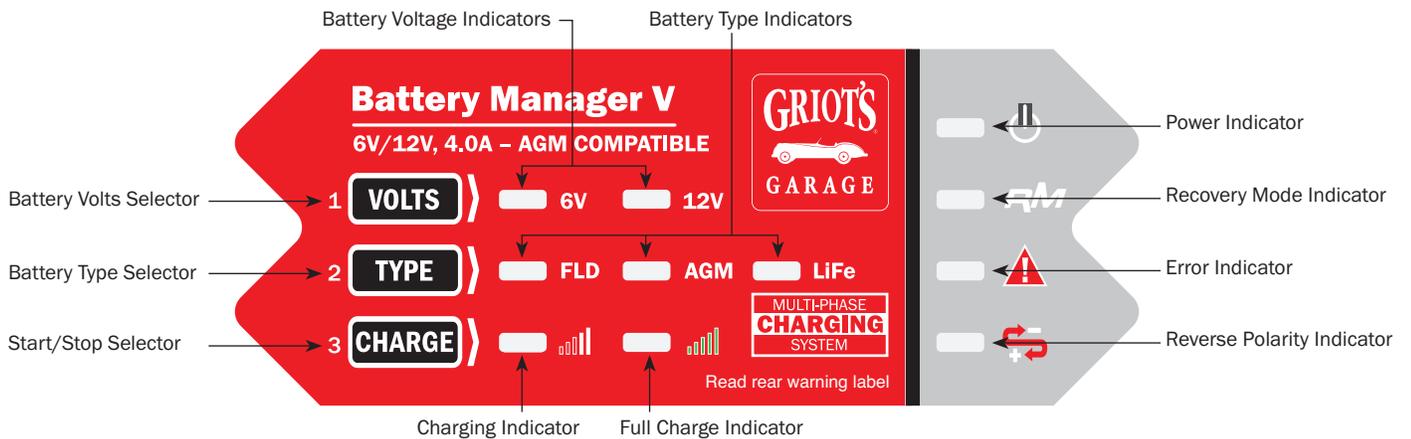
BATTERY MANAGER V

AUTOMATICALLY MAINTAINS PEAK BATTERY CHARGE
FOR USE ON 6-VOLT & 12-VOLT BATTERIES



FEATURES & SPECIFICATIONS

- Reverse Polarity Protection
- Input: 120V_{AC} ~ 60Hz 1.0A 120W
- Output: 12V_{DC} 4.0A, 6V_{DC} 4.0A
- Reconditions Dead & Weak Batteries
- Use With 6V Or 12V Batteries
- Recovery Mode (Resumes Charging After Power Failure)
- Safe, Multi-Phase Charging Process
- Exercising Mode Maintains Battery Health
- Cable Clamps
- Hard-Wire Mount
- Battery Manager IV Cable Adapter
- Cigarette Lighter Adapter



Have fun in your garage!®

Thank you for choosing this quality Griot's product. The Battery Manager V features state-of-the-art technology to improve battery performance, longevity, and overall condition. Please read and understand all instructions before using the Battery Manager V. Enjoy the best!

SAFETY PRECAUTIONS

WARNING: Read these instructions completely before using the Battery Manager V and save them for future reference. Before using the Battery Manager V to charge a battery, read these instructions and the instruction manual/safety information provided by the car, truck, boat or equipment manufacturer. Following all manufacturers' instructions and safety procedures will reduce the risk of accident.

Working around lead-acid batteries may be dangerous. Lead-acid batteries release explosive gases during normal operation, charging and jump starting. Carefully read and follow these instructions for safe use. Always follow the specific instructions in this manual and on the Battery Manager V each time you use the Battery Manager V. All lead-acid batteries (car, truck and boat) produce hydrogen gas which may violently explode in the presence of fire or sparks. Do not smoke, use matches or a cigarette lighter while near batteries. Do not handle the battery while wearing vinyl clothing because static electricity sparks are generated when vinyl clothing is rubbed. Review all cautionary material on the Battery Manager V and in the engine compartment.

Always wear eye protection, appropriate protective clothing and other safety equipment when working near lead-acid batteries. Do not touch eyes while working on or around lead-acid batteries. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with cold running water for at least 10 minutes and get medical attention immediately.

Always store clamps away from each other or common conductors. Improper storage of clamps may cause the clamps to come in contact with each other, or a common conductor, which would be hazardous if the unit was plugged into an AC outlet.

Use extreme care while working within the engine compartment, because moving parts may cause severe injury. Read and follow all safety instructions published in the vehicle's Owner's Manual.

Batteries being charged with the Battery Manager V unit likely contain liquid acids which are hazardous if spilled. Failure to follow instructions may cause damage or explosion, always shield eyes. Read entire instruction manual before use.

Warning: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Wash hands after handling.

PREPARING TO CHARGE A BATTERY

1. If it is necessary to remove the battery from the vehicle to charge, always remove the grounded terminal from the battery first. Make sure all accessories in the vehicle are off, to avoid causing an arc.
2. Be sure the area around battery is well ventilated while battery is being charged. Make sure there is no gasoline or other combustible material in the vicinity.
3. Clean battery terminals with a mixture of baking soda and hot water. Be careful to avoid corrosion coming in contact with eyes.
4. 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 Maintenance-Free Batteries, carefully follow the manufacturer's recharging instructions.
5. Study all battery manufacturer's specific precautions, i.e. - removing/not removing cell caps while charging and recommended rates of charge.
6. Determine voltage of battery by referring to vehicle owner's manual and make sure that charger output voltage matches.

LOCATING THE CHARGER

1. Locate the charger as far away from the battery as the cables permit.
2. Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
3. Never allow battery acid to drip on the charger when reading specific gravity or filling the battery.
4. Do not operate the charger in a closed area or restrict ventilation in any way.
5. Do not set a battery on top of the charger.
6. Locate the charger at least 18" above the floor.
7. Do not place the charger where rain, snow or other moisture could drip on it.

CONNECTING TO BATTERY INSTALLED IN A VEHICLE

Caution: A marine (boat) battery must be removed and charged on shore. To charge it onboard requires equipment specially designed for marine use.

Caution: A spark near the battery may cause battery explosion. To reduce this risk:

1. Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
2. Stay clear of fan blades, belts, pulleys and other parts that can cause injury to persons.
3. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
4. Determine which post of battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see instruction 5a. If the positive post is grounded to the chassis, see instruction 5b.
5. a) For NEGATIVE GROUNDED vehicle, connect POSITIVE (Red) clip from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery.
b) For POSITIVE GROUNDED vehicle, connect the NEGATIVE (Black) clip from the battery charger to the NEGATIVE (NEG, N, -) ungrounded post of the battery. (This arrangement is usually found in pre-1970 foreign vehicles or pre-1970 farm tractors. This is a rare occurrence.)
6. Connect the remaining battery charger clip to the vehicle chassis or engine block, as far away from the battery as possible. Do not connect the clip to carburetor, fuel lines or sheet metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
7. When disconnecting charger, turn charging sequence OFF by depressing the "CHARGE" button, disconnect AC cord, remove clip from vehicle chassis and remove clip from battery terminal.
8. Refer to the Operating Instructions for information on setting selector switches.

CONNECTING TO BATTERY OUTSIDE OF A VEHICLE

1. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
2. Attach at least a 24" long, #6 gauge (AWG) insulated battery cable (not included) to NEGATIVE (NEG, N, -) battery post.
3. Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
4. Position yourself and the free end of the cable (installed in step #2) as FAR away from the battery as possible. FACING AWAY FROM THE BATTERY, connect the NEGATIVE (Black) charger clip to the free end of the cable.
5. When charging is complete, turn charging sequence off by depressing the "CHARGE" button. Then disconnect charger, always in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.

SELECTING THE BATTERY TYPE

For Conventional and Maintenance-Free flooded (wet) batteries, the ideal Battery Type selection is "FLD." For batteries identified as AGM construction, the ideal Battery Type selection is "AGM". For most Spiral Wound batteries, the best Battery Type selection is "AGM". For Deep Cycle & Marine batteries, determine whether it's a wet cell or another type of construction. This will determine the proper Battery Type selection. For most Lithium starting batteries, the ideal Battery Type selection is LiFe (LiFePO₄ - Lithium Iron Phosphate).

NOTE: When charging lithium batteries, please note that there are many different lithium battery chemistries. The Lithium charging setting on this charger is specifically for Lithium Iron Phosphate (LiFePO₄) batteries and only these lithium batteries. The charger should never be used for charging any other lithium battery type.

OPERATING INSTRUCTIONS

Upon making a proper battery connection, plug AC power cord into an AC receptacle. All unit LEDs will light momentarily, then only the LEDs corresponding to charging settings should stay lit. The charger is now in Standby Mode. If an ERROR Indicator LED illuminates, disconnect from AC power supply immediately and determine the cause of the alarm. The POLARITY light indicates reverse polarity error connection, while the ERROR light indicates the detection of a battery fault, such as a shorted connection. To charge a battery:

1. Choose a battery voltage charge setting. The default setting is the 12V mode, which will apply to most charging applications. To charge in 6V mode, push the voltage setting button until the "6V" LED is lit.
2. Choose a battery type. Refer to "Selecting The Battery Type" above.
3. Press the "CHARGE" button and the charging indicator LED will illuminate. The charger will automatically commence and complete the charging process. If you press the "CHARGE" button at any point during the charging sequence, the charger will stop charging and return to Standby Mode. **Note 1:** If the ERROR LED illuminates, disconnect from AC power immediately and determine the cause of the alarm. See Battery Manager V Features for a list of conditions that might cause this warning. **Note 2:** The charger is designed to protect against faults and shorts (see Battery Manager V Features). If the battery to be charged has an open circuit voltage of less than 1V, the charger will indicate a fault. If, after unplugging unit, checking connections and verifying all settings, you determine the problem causing the "fault" condition is battery voltage below 1V, you can override the charger's protection by holding down the "CHARGE" button for 3 seconds. The charger will commence the charging sequence and, assuming there are no other hindrances that caused the fault indication, will complete the charging process and automatically turn off when the battery has reached full charge.
4. When the battery approaches full charge and enters the Completion Phase, the green FULL CHARGE indicator will light and the CHARGING

- LED indicator will flash. At this point, if time is critical, the battery can be put into service if it will be used in a charging situation, such as in a vehicle that will be used immediately. To reach a true 100% state of charge, the charger should stay connected until the charger reaches the Rest Phase, when only the green CHARGING COMPLETE is slowly flashing.
5. When you are finished with the charging process, disconnect AC power cord from AC outlet, then disconnect DC leads from vehicle ground (if charging with battery in vehicle) and battery in the reverse sequence of the connection procedure.
 6. In the event of a power outage, your Battery Manager V is equipped with a RECOVERY MODE feature. See back page for details.

SEE MULTI-PHASING CHART ON BACK PAGE

BATTERY MANAGER V FEATURES

The charger uses a proprietary Multi-Stage charging process designed to optimally charge and maintain batteries.

ENERGIZING PHASE

The charging process includes an initial energizing mode in which the charger determines the best charging path for the connected battery. The charger then enters the Fast Charge stage (most cases), Soft Start Mode, Battery Recondition Mode or stops the charging routine because unsafe battery conditions (short, etc.) are detected.

SOFT START MODE

Soft Start Mode is activated when the charger is connected to a deeply discharged battery. This mode protects the battery during the initial charge period, as the battery's voltage rises to a more normal level, and is beneficial for the long-term health of the battery.

BATTERY RECONDITIONING MODE

During the Energizing Phase, if the charger detects the presence of battery sulfation, it will activate this mode. If this occurs, the CHARGING LED will flash. This indicates the charge time will be extended while the charger attempts to recondition the battery.

IDEAL BATTERY MAINTENANCE

A key feature of this charger is how it manages a battery that remains on the charger after a complete charge has been achieved, such as during the storage of a seasonal use vehicle. Once the charger reaches the Resting Phase, its output is virtually turned off, except to occasionally monitor battery condition. This is beneficial for the connected battery, as it reduces chemical reaction within the battery compared to traditional charger maintenance modes. This greatly reduces the chance of damaging a battery in long-term storage. In addition, during the exercising phase, it introduces a load on the battery, simulating active use and recharges the battery to full charge. This Exercising feature keeps the battery in optimal condition during periods of storage and non-use.

COMPATIBLE WITH MULTIPLE BATTERY TYPES

The charger will properly charge a wide variety of battery types, including Conventional, Maintenance-Free, AGM, Spiral Wound, Depp Cycle, Marine and LiFePO₄ Lithium batteries.

SMART CLAMP TECHNOLOGY

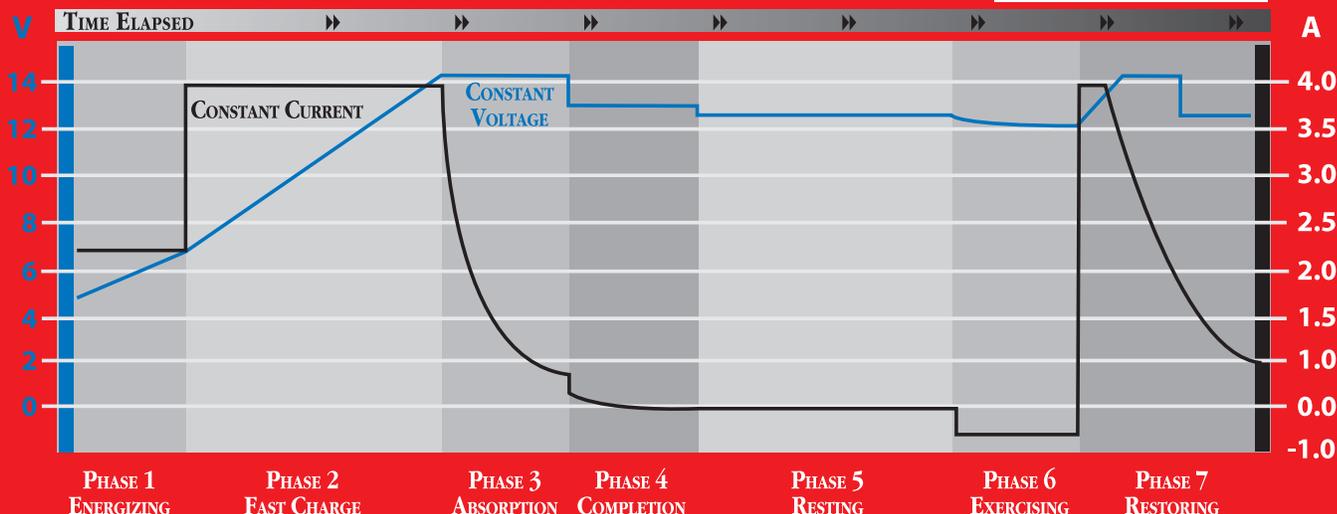
The charger will send power to the output leads only when a proper battery connection is made.

REVERSE POLARITY PROTECTION

Guards against reverse connections. POLARITY LED will light on control panel and power will not be sent to output cables if a reverse connection is sensed.

MULTI-PHASE CHARGING PROCESS

VOLTAGE CURRENT



	PHASE 1 ENERGIZING	PHASE 2 FAST CHARGE	PHASE 3 ABSORPTION	PHASE 4 COMPLETION	PHASE 5 RESTING	PHASE 6 EXERCISING	PHASE 7 RESTORING
CHARGING LED	ON	ON	ON	FLASHING	OFF	FLASHING	SEE PHASES 2 - 4
COMPLETE LED	OFF	OFF	OFF	ON	SLOWLY FLASHING	FLASHING	INDICATORS

TEMPERATURE COMPENSATION

The charger is equipped with temperature compensation technology, which alters the charging parameters based on ambient temperature. This is beneficial for battery health, as it is critical in achieving an optimal charge because the battery's needs change based on temperature.

BATTERY FAULT PROTECTION

Guards against excessively charging compromised batteries. ERROR and CHARGING LED will flash indicating charging has stopped and the charger has detected a compromised battery. Conditions that cause this error include: if the battery voltage does not rise appropriately during the charging process (indicating a shorted cell) or if the maximum charge time has been exceeded.

SHORT CIRCUIT PROTECTION

Guards against shorted connections. ERROR LED will light solid on control panel and power will not be sent to output cables. This condition is triggered if the charger detects less than 1V across the clamps. See Operating Instructions Step 3 Note 2 for details regarding this feature.

OVER-VOLTAGE PROTECTION

Guards against charging errors where the charger is programmed to charge in a different voltage than the detected voltage of the battery. When this safeguard is engaged, the ERROR indicator will light. To reset the charger, disconnect from AC outlet, reset the vehicle connections and reconnect to the AC outlet.

RECOVERY MODE

The charger is equipped with the ability to react to the interruption of power (power outage) in two different ways. The factory default setting is Recovery Mode ON, under which the charger will continue to monitor the battery during a power outage situation and resume charging under the existing charging parameters upon the resumption of AC power. This feature is best utilized during periods when occasional monitoring of the charger is not possible, such as when you are on vacation.

You can switch to Recovery Mode OFF, which turns the charger OFF if there is any interruption of AC input power. So, if the power goes out, the charger will stop charging and enter Standby Mode, with default settings, upon the resumption of AC power.

To switch Recovery Mode from OFF to ON or ON to OFF, press and hold both the Battery Type and CHARGE button and push the Voltage Selection button twice. Recovery Mode status is indicated by the RM LED – when the RM LED is lit, Recovery is ON.

When the charger is in Recovery Mode ON and a power interruption occurs, all charger status LEDs will turn off, except the RM LED, which will blink. After 36 hours, to conserve the charge on the connected battery, all LEDs will turn off. Upon resumption of power, the charger will resume normal operation in the existing settings and status indicators will again be active.

ANSWERS TO YOUR QUESTIONS

Should you have any comments or questions about the use of your Battery Manager V, our Customer Service Department can be reached by phone at 800-345-5789 or by email at info@griotsgarage.com. For a complete selection of products or to receive a free GRIOT'S GARAGE Handbook, please call us or visit us at www.griotsgarage.com.

Have fun in your garage!