

Instruction Manual

For

**Reverse Pulse Battery
Regenerator and Charger**

12/24 V Series

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS: This manual contains important safety and operating instructions for UltiPower battery chargers, **CAREFULLY READ THESE INSTRUCTIONS BEFORE USING THE BATTERY CHARGER.**

WARNING AND CAUTION LABEL DEFINITIONS:

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death.

CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation that if not avoided, may result in property damage.

GENERAL PRECAUTIONS

WARNING

Battery posts, terminals and related accessories contain lead and lead components, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Always, wash your hands after handling these devices.

WARNING

Do not operate the battery charger with damaged AC power cords or plugs or DC output cords or accessories. Replace accessories immediately. Since neither the AC power cord nor the DC output cord can be replaced, if either cord is damaged the battery charger should be scrapped. The limited warranty does not cover AC power cords or DC output cords that are damaged in use.

CAUTION

WORKING WITH LEAD ACID BATTERIES AND BATTERY CHARGERS: All lead acid batteries have the potential to emit gasses that may combine into a combustible or explosive mixture. In many cases, it is possible that lead acid batteries will emit these gasses during normal discharge and charging operations. Because of this potential danger. It is important that you follow the precautions recommended by both the battery and battery charger manufacturers before using either one. For example, do not exceed the recommended maximum recharge rate (charger output current limit), or remove cell caps while charging flooded batteries.

CAUTION

CHARGER VOLTAGE COMPATIBILITY: NEVER use a battery charger unless the battery voltage matches the output voltage rating of the charger. For example, do not use a 12-volt charger with a 6-volt battery and vice-versa.

CHARGER LOCATION: LOCATE the charger as far away from the battery as is allowed by the length of the output cable harness, NEVER set the charger above the battery. NEVER place the battery, the charger, or any of the electrical connections between them in an area that is likely to become wet

EXCESSIVE MOISTURE: Do not expose the battery charger or any of its electrical connections (either AC or DC) to rain, snow, or extremely high, condensing humidity.

CHARGER ATTACHMENTS: Do not use attachments that are not recommended or sold by the charger manufacturer. To do otherwise may result in the risk of electric shock, fire, or possibly some other unforeseen potential personal injury situations.

HANDLING POWER CORDS: When handling electric power cords, always pull by the plug rather than by the cord. This will reduce the risk of damage to both plug and cord, and it will minimize the likelihood of electric shock resulting from that damage.

LOCATION OF POWER CORDS: Make sure all electric power cords are located so that they cannot be stepped on, tripped over, or otherwise subjected to damage or stress.

MONITORING SEALED & NON-SEALED BATTERIES: When leaving a battery charger connected to either a sealed (AGM or GEL) or non-sealed (flooded battery) for extended periods of time (weeks, months, etc.), periodically check the battery to see if it is unusually warm. This is an indication that the battery may have a weak cell and that it could go into a thermal runaway condition. If the battery releases an excessive amount of gas or if the battery gets hotter than 130°F (55°C) during charging, disconnect the charger and allow the battery to cool. Overheating may result in plate distortion, internal shorting, drying out or other damage. For flooded batteries, also check individual cell fluid levels against manufacturer's recommendations for safe operation.

⚠ WARNING

ELECTRIC SPARK & OPEN FLAME: NEVER smoke or allow a source of electric spark or open flame in the vicinity of the battery or engine. (For example: Don't charge the battery next to a gas water heater).

VENTILATION: Do not operate the charger where ventilation is restricted. The intent here is to allow sufficient airflow to minimize and dissipate the heat generated by the charger and to diffuse the gasses that may be emitted by the battery.

CHARGER MAINTENANCE: NEVER DISASSEMBLE OR ATTEMPT TO DO INTERNAL REPAIRS. THIS VULDS THE BATTERY WARRANTY. Assembling the charger incorrectly may result in the risk of electric shock or create a fire hazard.

⚠ WARNING

EXTENSION CORDS: An extension cord should not be used unless absolutely necessary. Using improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure that: The pins on the extension cord plug have the same number, size, and shape as those of the AC power cord plug on the charger;
The extension cord is properly wired and is in good electrical condition;

PERSONAL PRECAUTIONS

⚠ WARNING

WHEN YOU WORK NEAR LEAD-ACID BATTERIES:

1. Someone should be within range of your voice or close enough to come to your aid if you have an accident;
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes;
3. Wear complete eye protection and protective clothing. Avoid touching your eyes while working near a battery. If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flood the eye with running cold water for at least 10 minutes and get medical attention as soon as possible;
4. Be extra cautious when handling metal tools around a battery. If you drop a metal tool near a battery it might spark or create a short circuit between the battery terminals and some other metal part. Either event may cause a dangerous electrical shock hazard, a fire, or even an explosion;
5. Remove all personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuited current high enough to weld a metal ring or other piece of jewelry, causing a severe burn;
6. Use UltiPower chargers for charging lead-acid batteries only. They are not intended to supply power to an extra low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property;

INFORMATION NOTE ABOUT DRY-CELL BATTERIES: There are some wet, non-spillable, lead acid batteries on the market whose manufacturers' make the claim that they are dry-cell batteries. These batteries are sealed, gas-recombinant, starved electrolyte, possibly with AGM (Absorbed Glass Mat) type construction. If you have any doubt about the type of battery that you have, please contact the battery manufacturer before attempting to charge the battery.

7. NEVER charge a visibly damaged or frozen battery.

PREPARING TO CHARGE

- a) 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.
- b) Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by fanning the area with a piece of cardboard or other non-metallic material.
- c) Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- d) Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps to purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instruction.
- e) Study battery manufacturer's specific precautions such as removing or not removing cell caps while charging.
- f) Determine voltage of battery by referring to car owner's manual and make sure that the output voltage selector switch is set at correct voltage.

CHARGER LOCATION

- a) Locate charger as far away from the battery as battery charger cables permit.
- b) Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- c) Never allow battery acid to drip on charger.
- d) Do not operate charger in a closed-in area or restrict ventilation in any way.
- e) Do not set a battery on top of charger.

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

IF THE BATTERY MUST BE REMOVED FROM THE VEHICLE:

- 1: To avoid an electric arc (or spark), turn off or disconnect all of the accessories in the vehicle. Then always remove the cable that is connected to grounded terminal from battery first;
- 2: If necessary, clean the battery terminals. Be careful to keep the corrosion and other debris from coming in contact with your eyes;
- 3: If the battery is not a sealed battery, then if necessary, add distilled water to each cell until the battery acid solution reaches the level specified by battery manufacturer. Do not overfill;
- 4: Before inserting the charger AC power plug into the electrical outlet, check the polarity of the battery posts, and attach at least a 24 inch long 6 (AWG) insulated, battery extension cable to the negative to the battery post. Then connect the appropriate charger DC output connectors to the battery and the extension cable, positive to positive and negative to negative. Never allow the alligator clips or terminal rings to touch each other after they are connected to battery charger.
- 5: Connect the AC power plug to the electrical outlet.

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN THE VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION.

1. DO NOT CONNECT THE CHARGER AC POWER PLUG TO THE ELECTRICAL OUTLET UNTIL ALL OTHER CONNECTIONS ARE MADE!
2. Place both the AC and DC power cords in the best position to avoid accidental damage by moveable vehicle parts, i.e. hoods, doors, or moving engine parts(fan blades, belts, or pulleys).
3. Check the polarity of the battery posts. If the positive (pos,p,+) post is connected to the vehicle chassis, then the vehicle has a positive ground system. If the negative(neg,n,-)post is connected to the vehicle chassis, then the vehicle has a negative ground system. Negative ground systems are the most common.
4. For negative ground system, connect the positive(red) alligator clip, or ring terminal to the positive battery post. Then connect the negative(black)alligator clip, or ring terminal to the vehicle chassis. Do not make the negative charger clip or ring connection to the carburetor, fuel lines, or thin, sheet metal part of the frame.
5. For positive ground system, connect the negative(black)alligator clip, or ring terminal to the negative battery post. Then connect the positive(red)alligator clip, or ring terminal to the vehicle chassis. Do not make the positive charger clip or ring connection to the carburetor, fuel lines, or thin, sheet metal parts. Make that connection to the engine block or a heavy gauge metal part of the frame.
6. Connect the AC power plug to the electrical outlet.

ADDITIONAL CHARGER INFORMATION

AUTOMATIC CHARGING AND BATTERY STATUS MONITORING: The UltiPower chargers are complete automatic and may be left connected to both AC power and to the battery that it is charging for long periods of time . However, it is prudent to periodically check both the battery and the charger for normal operation during these extended charging periods.

The charger output power ,voltage ,and current all depend on the condition of the battery that is being charged. UltiPower chargers have display or status lights that indicate the operating mode of the charger, and the condition of the battery that is connected to the charger.

When the battery is fully charged, the green status indicator light will turn on or END displayed. UltiPower chargers will automatically monitor and maintain the battery at full charge.

SPECIAL FEATURES: The UltiPower chargers have the following special features:

SPARKPROOF: The battery charger DC output leads, either ring terminals or alligator clips must be connected to a battery before an output voltage is developed by the battery charger.

SHORT CIRCUIT PROTECTION: The battery charger can sustain a short circuit connection directly across its DC output terminals indefinitely without any risk of either electric shock or excessive heat.

REVERSE POLARITY PROTECTION : The battery charger is protected internally against any damage due to the DC output leads being connected to the opposite polarity battery post .NO damage will result to either the battery or the battery charger.

WORKING WITH A DEAD BATTERY OR A BATTERY WITH A VERY LOW VOLTAGE:

If you try to charge a dead battery having a voltage below 3 Volts, the UltiPower chargers will not start to charge because an internal safety circuit prevents the battery chargers from generating any DC output voltage.

NOTE:

If a 12 volt, Lead-Acid battery has an output voltage of less than 9 volts when it is at rest. When it is neither being charged nor supplying electrical current to an external load, there is a good chance that the battery is defective. As a frame of reference, a fully charged 12-Volt, Lead-Acid battery rest state, no-load voltage of approximately 12.9 Volts. A fully discharged 12-Volt, Lead-Acid battery will have a rest-state, no-load voltage of approximately 11.4 volts. That means that a voltage change of only 1.5 volts represents the full range of charge 0 % to 100 % on a 12-volt, Lead-Acid battery. Depending on the manufacturer, and the age of the battery, the specific voltages will vary by a few tenths of a volt, but the 1.5-volt range will still be a good indicator of the battery charge %.

STATUS DISPLAY: The following describes the charger display. Note that some modes may only have indicator lights.

0000 flash continuously: Charger checking battery status when battery and AC power are connect. This may last for several seconds depends on battery condition.

00U: No battery connected.

XXXX: Numbers indicate battery real time voltage, this numbers are changing accordingly depend on the charging of battery voltage.

TEST: A 3-minute process to check whether battery can hold the charge in this process. If battery voltage drops too fast, E5 may be displayed that indicates battery may be defective.

HXXX: A 1-hour count down mode to ensure battery is possibly fully charged or ensure an already full battery be replenished to its largest extend.

END: End of charge process, charger will automatically monitor and maintain the battery at full charger.

TROUBLESHOOTING CHECK LIST:

1. Neither of the charger lights or display turns on after the AC power plug is connected to the AC electrical outlet: Check the charger AC power plug connection at the AC electrical outlet. Verify that the AC electrical outlet is functioning properly by plug in another appliance or a voltmeter.

2. E5 displayed immediately when AC power is applied to the charger.
Battery capacity may be too small for the charge current.

3. END displayed immediately when AC power is applied to the charger.
The battery might already be fully charged, or battery may be defective.

4. Charger is charging but the END does not display in a reasonable amount of time.
The battery may be large and requires more time to fully charge than originally expected. There may be another appliance drawing electric power from the battery while it is charging, or the battery may be defective. Also, a newly purchased battery may not be fully charged and may take longer to charge initially. The charger display on depends on the condition of battery that being charged. Batteries due to different type and time being in use, may present different condition even for different single charge job.

DIGITAL DISPLAY (if available)

The charger display error mode in the following situations:

- 1.00U No battery connected
- 2.E- Reverse polarity
- 3.E1 Output short circuit
- 4.E2 Replace fuse
- 5.E3 Battery voltage abnormal, battery severely discharged or battery defective
- 6.E4 Fan error
- 7.E5 Battery test error, battery may be defective

INDICATION LIGHTS (if available)

- Green on: AC present No battery
- Red on: Charging
- Green & red on: Maintenance & battery for use
- Green on: Charge complete
- Yellow Blinks 1X: Output short circuit
- Yellow Blinks 2X: Fuse Fault
- Yellow Blinks 3X: Abnormal battery voltage
- Yellow Blinks 4X: Fan error
- Yellow Blinks 5X: Reverse polarity

TECHNICAL DATA FOR 12V SERIES

Voltage AC	110VAC/220VAC/95-240VAC, 50-60 Hz.
Output voltage	Nominal 12V
Charge control	12.0 V, 13.6 V, 14.4V /14.7V
Charging Current	1A 2A 3A 5A 8A 10A 12A 15A 18A 20A 25A 30A
Cooling	Fan, do not cover the charger.
Type of batteries	All types of lead-acid batteries (Wet, Maintenance Free, VRLA, AGM and most GEL).
Ambient temperature	-20° C to 50° C
Type of charger	Automatic 7 step, switch mode with negative pulse maintenance

TECHNICAL DATA FOR 24V SERIES

Voltage AC	110VAC/220VAC/95-240VAC 50-60 Hz.
Output Voltage	Nominal: 24V
Charge Control	20.0 V, 21.5 V, 27.5V /supply 29.5V, 25.8V-28.8/auto
Charging Current	1A 2A 3A 5A 8A 10A 12A 15A 18A 20A 25A 30A
Cooling	Fan, do not cover the charger.
Type of Batteries	All types of lead-acid batteries (Wet, Maintenance Free, VRLA, AGM and most GEL).
Ambient Temperature	-20° C to 50° C
Type of Charger	Automatic 7 step, switch mode with negative pulse maintenance