



MODEL: ENC2A

## BATTERY CHARGER OPERATOR'S MANUAL

### IMPORTANT SAFETY INSTRUCTIONS

1. **SAVE THESE INSTRUCTIONS.** This manual contains important safety and operating instructions. You may need to refer to these instructions at a later date.
2. **CAUTION.** To reduce risk of injury, charge only a LEAD-ACID battery, including AGM, STD, WET, CAL and GEL. Charging other types of batteries, like Lithium batteries or dry-cell batteries, may burst causing personal injury and property damage.
3. Do not expose charger to rain or snow.
4. 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.
5. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
6. Make sure cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
7. 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:
  - a. That pins on plug of extension cord are the same number, size, and shape as those of plug on charger;
  - b. That extension cord is properly wired and in good electrical condition; and
  - c. If the length of the extension cord is less than 15 meter, use a 0.75mm<sup>2</sup> cord, If 30meter - 1mm<sup>2</sup>, 60 meter -1.5mm<sup>2</sup>.
8. Do not operate charger with damaged cord or plug, replace the cord or plug immediately.
9. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
10. Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
11. To reduce risk of electric shock, unplug charger form outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

### 12. WARNING - RISK OF EXPLOSIVE GASES

- a. **WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.**
- b. 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 marking on these products and on engine.

### 13. PERSONAL PRECAUTIONS

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

- d. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enter eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- e. NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- f. 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 explosion.
- g. Remove 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 circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- h. 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 and cause injury to persons and damage to property.
- i. NEVER charge a frozen battery.

### 14. PREPARING TO CHARGE

- a. If necessary to remove battery from vehicle to charge, always remove the 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 using a piece of cardboard or other non-metallic material as a fan.
  - 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 purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instructions.
  - e. Study all the battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
  - f. Determine voltage of battery by referring to car owner's manual and make sure that output voltage selector switch is set at correct voltage.
- If charger has adjustable charge rate, charge battery initially at lowest rate.

### 15. CHARGER LOCATION

- a. Locate charger as far away from battery as dc 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 when reading gravity or filling battery,
- 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.

### 16. DC CONNECTION PRECAUTIONS

- a. Connect and disconnect dc output clips only after setting any charger switches to off position and removing ac cord from electric outlet. Never allow clips to touch each other.
- b. Attach clips to battery posts and twist or rock back and forth several times to make a good connection. This tends to keep the clips from slipping off terminals and helps to reduce risk of sparking.

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

- a. Position ac and dc cords to reduce risk of damage by hood, door, or moving engine part.
- b. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- c. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- d. Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see item "e". If positive post is grounded to the chassis, see item "f".
- e. For negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet metal body parts. Connect to a heavy gage metal part of the frame or engine block.
- f. For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
- g. When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
- h. See operating instructions for length of charge information.

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

- a. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- b. Attach at least a 60cm-long 16mm<sup>2</sup> insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- c. Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- d. Position yourself and free end of cable as far away from battery as possible - then connect NEGATIVE (BLACK) charger clip to free end of cable.
- e. Do not face battery when making final connection.
- f. When disconnecting charger, always do so in reverse sequence of connecting procedure and break the first connection while as far away from battery as practical.
- g. A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

**19. AC POWER CORD CONNECTION INSTRUCTIONS**

The plug must be plugged into an outlet that is properly installed in accordance with all local codes and ordinances.

**DANGER.** Never alter AC cord or plug provided - if it will not fit outlet, have proper outlet installed by a qualified electrician. Improper connection can result in a risk of an electric shock. This battery charger is for use on a nominal 110-volt circuit.

**20. LENGTH OF CHARGE**

The following instruction will allow you to determine how long it will take to bring a specific battery to full charge.

- a. Test the battery for state of charger with a hydrometer or electronic percent-of-charge

tester.

- b. Determine the size of the battery in Amp-Hour or Reserve Capacity. If the ratings are not printed on the battery, contact your local battery dealer for this information. These are the only ratings that can be used to determine length to charging time.
- c. Use the battery rating, the charge level of the battery, and amp setting to be used on the charger in the formula provided below.

$$\frac{\text{Amp Hour Rating of Battery} \times \text{Percent of Charged Needed}}{\text{Amp Setting Selected On Charger}} \times 1.25 = \text{Hours to Charge}$$

- d. If the battery is rated in Reserve Capacity, use the following formula to convert reserve capacity to amp-hours.

$$\frac{\text{Reserve Capacity}}{2} + 15.5 = \text{Amp-Hour Rating}$$

NOTE: The length of charge times are approximate and vary from the battery to battery. Always follow the battery manufacturer's specific charging instructions.

**21. OPERATING INSTRUCTIONS**

**Before using review all safety and connection directions before using charger. Failure to do so can damage battery and cause serious injury or death.**

**FEATURES:**

All automatic chargers come with an Automatic Float Charge circuit, LED digital display

**ENC2A**      SELECT VOLTAGE switch with the following selections:  
2.0A-6V and 2.0A-12V  
6V Indicator LED(flash charging, solid charged)  
12V Indicator LED(flash charging, solid charged)  
Error Indicator LED

**Charging:**

- Connect the charger to battery per instructions in sections 16 & 17 or 18.
- Connect the charger to AC outlet.
- Select the appropriate charger voltage for your battery.
- If the charger does not detect a properly connected battery, the Error LED will light until such a battery is detected. Charging will not begin while the Error LED is on. When the charging begins, the 6v(HFP2.0DV only) or 12v LED will be lit.
- When charging is complete, unplug the charger from the AC outlet.

Automatic Micro Processor Control Unit Charge:

**Stage 1** —Diagnosis: Analysis the battery can accept charge or not, prevent charging from proceeding on the a defective battery;

**Stage 2**—Pre-charge: Battery V <12V, small current to charge, better maintenance battery;

**Stage 3** — Soft start: Bulk charging process with a gentle (soft) charge.

**Stage 4**—CC (Constant Current):Fast speed charging;

**Stage 5**—CV(Constant Voltage)Absorption to voltage 14.6V, This is a charge cycle for batteries nearly full. It will top off the battery at 14.6VDC;

**Stage 6**—Resting: Cut off with full charged statement, high energy efficiency;

**Stage 7**—Restoring: Automatic On-off Monitoring. The charger dc output will shut off and monitor a fully charged battery. If the battery falls below 12.8VDC, the charger will restart and enter into stage one.

## 22. POSSIBLE CHARGING PROBLEMS

PROBLEM	CAUSE	SOLUTION
Bad Battery	The Error LED may light when the battery voltage is less than 1.5V and more than 0.5V, or the voltage is more than 7.5V (6V mode HFP2.0DV only) 15V (12V mode); The battery voltage is lower than 5.5V (6V HFP2.0DV only), 11V (12V), after charging 20 minutes;	Have the battery tested by a qualified technician.
Battery not accepting a charge	<ul style="list-style-type: none"> <li>·Lack of AC input power</li> <li>·Faulty connections to battery terminals</li> <li>·Wrong charge voltage selection</li> <li>·Battery voltage too low</li> <li>·Charging a very cold battery</li> </ul>	<ul style="list-style-type: none"> <li>·Make sure that the charger is plugged into AV outlet and the POWER LED is lit.</li> <li>·Unplug the charger and check the battery connection; ensure that there is a good connection at the battery terminal/post and/or vehicle chassis.</li> <li>·Check that the correct charge voltage was selected for the battery being charged.</li> <li>·Ensure enough charging time was allowed to charge battery.</li> <li>·If the battery to be charged is extremely cold (in temperatures below freezing 0°C), it will not accept a high rate of charge, so the initial charger rate will be slow. The rate of charger will increase as the battery warms. Never attempt to charge a frozen battery.</li> </ul>

## 23. MAINTANENCE INSTRUCTIONS

This charger requires minimal maintenance. As with any appliance or tool, a few common sense rules will prolong the life of the battery charger.

ALWAYS BE SURE THE CHARGER IS UNPLUGGED BEFORE PERFORMING ANY MAINTENANCE OR CLEANING.

1. Store in a clean, dry place
2. Coil up the cords when not in use.
3. Clean the case and cords with a slightly damp cloth.
4. Clean any corrosion from the clamps with a solution of water and baking soda.
5. Examine the cords periodically for cracking or other damage and have them replaced if necessary.

6. **WARNING:** All other service should be done by qualified personnel only.

## Warranty and Return

### Warranty by PowerBright

**What does this warranty cover?** This Limited Warranty is provided by PowerBright and covers defects in workmanship and materials in your ENC2A. This warranty period lasts for 24 months from the date of purchase at the point of sale to you, the original end user customer. Proof of purchase is required to make warranty claims.

**What will PowerBright do?** PowerBright will, at its option, repair or replace the defective product free of charge, provided that you notify PowerBright of the product defect within the Warranty Period, and provided that PowerBright, through inspection, establishes the existence of such a defect and that it is covered by this Limited Warranty. PowerBright will, at its option, use new and / or reconditioned parts in performing warranty repair and building replacement products. PowerBright reserves the right to use parts or products of original or improved design in the repair or replacement. If PowerBright repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the return shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the property of PowerBright. PowerBright covers both parts and labor necessary to repair the product, and return shipment to the customer via a PowerBright selected non-expedited surface freight within the contiguous United States and Canada. Alaska and Hawaii are excluded. Contact PowerBright Customer Service for details on freight policy for return shipments outside of the contiguous United States and Canada.

**How do you get service?** If your product requires troubleshooting or warranty service, contact your dealer. If you are unable to contact your dealer, or the dealer is unable to provide service, contact PowerBright directly at:

Toll Free: 1 866.295.6775

Website: [www.EnergizerPower.com](http://www.EnergizerPower.com)



Conforms to UL Std. 1236  
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