

Energizer®



4AMP 9 STEP SMART CAR BATTERY CHARGER

CHARGES & MAINTAINS BATTERY

USER GUIDE

PLEASE SAVE THESE INSTRUCTIONS. THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS. READ AND FOLLOW ALL INSTRUCTIONS BEFORE EACH USE.



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Thank you for purchasing the Energizer® 4Amp 9 Step Smart Car Battery Charger. Always follow basic safety precautions when using electrical appliances. Please read all instructions carefully and keep this instruction manual safe for easy reference.

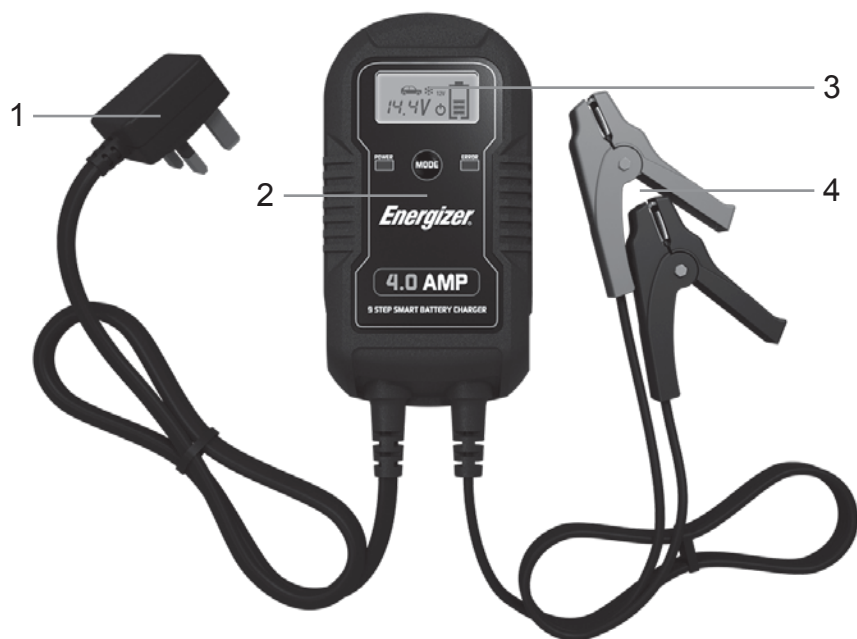
IMPORTANT SAFETY INSTRUCTIONS

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 wet cell, lead-acid, automotive type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage to property.
3. Do not expose the 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 personal injury.
5. To reduce the risk of damage to the electric plug and cord always pull by the plug rather than the cord, when disconnecting the charger.
6. Make sure the cord is located so that it will not be stepped on, tripped over, or otherwise damaged.
7. An extension cable should not be used unless absolutely necessary. Use of an improper extension cable could result in a risk of fire and electric shock. If an extension cable must be used, make sure that:
 - a. the pins on the plug of the extension cord are the same number, size, and shape as those on the plug of the charger;
 - b. the extension cable is properly wired and in good condition;
 - c. you use a 0.75mm² cable, if the extension cable is upto 15 metres in length, a 1mm² cable if the extension cable is upto 30 metres & 1.5mm² if the extension cable is upto 60 metres.
8. Do not operate the charger with a damaged cord or plug, replace the cord or plug immediately.
9. Do not operate the charger if it has received a sharp blow, been dropped, or been damaged in any way, instead take it to a qualified engineer for repair.
10. Do not disassemble the charger; take it to a qualified engineer when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
11. To reduce the risk of electric shock, unplug the charger before attempting any maintenance or cleaning. Just turning the charger off will **not** reduce the risk.
12. **WARNING - RISK OF EXPLOSIVE GASES**
 - a. WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON IT IS OF UTMOST IMPORTANCE TO READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY, EVERY TIME THE CHARGER IS USED.
 - b. To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in vicinity of the battery. Review cautionary markings on these products and on the engine.

PERSONAL SAFETY PRECAUTIONS

1. Someone should be able 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.
3. Wear complete eye and clothing protection. Avoid touching your eyes while working near lead-acid batteries.
4. If battery acid contacts your skin or clothing, wash immediately with soap and water. If you get acid in your eye, immediately wash your eye with cold running water for at least 10 minutes and get seek medical attention.
5. NEVER smoke or allow a spark or flame in vicinity of the battery or engine.
6. Be very careful not to drop anything onto a battery. It might spark or short circuit the battery or other electrical parts and cause an explosion.
7. Remove jewellery 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 jewellery to metal, causing a severe burn.
8. Only use the charger for charging AGM, GEL & WET batteries. It is not intended to supply power to a low-voltage electrical system other than in a starter motor application. Do not use the battery charger to charge dry-cell batteries that are commonly used in the home. These batteries may burst, cause injury and damage property.
9. NEVER charge a frozen battery.

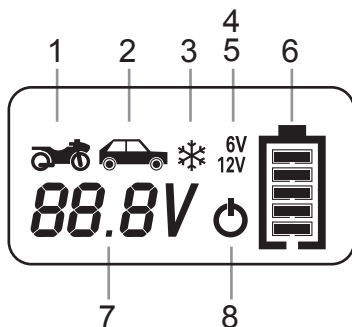
FEATURES



1. AC mains lead
2. Battery charger unit
3. LCD display
4. Fully insulated clamps

CONTROL PANEL

LCD DISPLAY



1. The icon will indicate 2A charge rate, which is used for charging the small capacity batteries used in a motorcycle, ATV, snowmobile, personal watercraft, garden tractor and golf car.
2. The icon will indicate 4A charge rate, which is used for faster charging of small-to-large capacity automotive, marine, deep cycle and farm tractor batteries.
3. Illuminates when charging in cold conditions, with the max charging voltage being 0.2V lower than usual.
4. "6V" appears when selecting the charge for 6V batteries.
5. "12V" appears when selecting the charge for 12V batteries.
6. Indicates that charging is in progress.
7. Indicates the battery's voltage or an error code.
8. Indicates that the charger's power is on. It stays on when in standby mode.

MODE SELECTION BUTTON

Press the Mode Selection Button to select one of the 6 charging modes.

Mode 1: 6V 2A (Icon ① + ④ will appear)

Mode 2: 6V 2A in the cold state (Icon ① + ③ + ④ will appear)

Mode 3: 12V 2A (Icon ① + ⑤ will appear)

Mode 4: 12V 2A in the cold state (Icon ① + ③ + ⑤ will appear)

Mode 5: 12V 4A (Icon ② + ⑤ will appear)

Mode 6: 12V 4A in the cold state (Icon ② + ③ + ⑤ will appear)

POWER INDICATOR LED

Indicates that the charger is on.

REVERSE POLARITY INDICATOR LED

Indicates that the battery clamps are incorrectly connected.

OPERATING INSTRUCTIONS

PREPARING TO CHARGE

- a. If it's necessary to remove the battery from the vehicle to charge it, always remove the earth terminal from the battery first. Make sure all accessories in the vehicle are off, so as not to cause a spark.
- b. Ensure that the area around the battery is well ventilated while charging.
- c. Clean battery terminals; being careful to keep corrosion from coming in contact with eyes.
- d. Add distilled water to each cell until the battery's acid reaches level specified by the battery's 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 the voltage of the battery by referring to the car owner's manual and make sure that the output voltage is set to the correct voltage. If the charger has an adjustable charge rate, charge the battery at the lowest rate initially.

CHARGER LOCATION

- a. Locate the charger as far away from the battery as the cables will allow.
- b. Never place the charger directly above the battery being charged; gases from battery will corrode and damage the charger.
- c. Never allow battery acid to drip on to the charger when reading the specific gravity or filling the battery.
- d. Do not operate the charger in an enclosed area, or restrict ventilation in any way.
- e. Do not put a battery on top of the charger.

DC CONNECTION PRECAUTIONS

- a. Only connect/disconnect DC output clamps when the charger is switched off and unplugged. Never allow clamps to touch each other.
- b. Attach clamps to battery posts and twist or rock back and forth several times to ensure a good connection. This tends to keep the clamps from slipping off the terminals and helps to reduce risk of sparking.

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

- a. Ensure that the AC and DC cords are positioned to avoid damage by the bonnet, door, or moving engine parts.
- b. Stay clear of fan blades, belts, pulleys, and other parts that could cause injury.
- c. Check polarity of battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.
- d. Determine which post of the battery is grounded (connected) to the chassis. If the negative post is grounded to chassis (as in most vehicles), go to section "e". If the positive post is grounded to the chassis, go to section "f".

- e. For negative-grounded vehicle, connect the POSITIVE (RED) clamp from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery. Connect the NEGATIVE (BLACK) clamp to the vehicle's chassis or engine block, away from the battery. Do not connect the clamp to the carburettor, 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 the NEGATIVE (BLACK) clamp from the battery charger to the NEGATIVE (NEG, N, -) ungrounded post of the battery. Connect the POSITIVE (RED) clamp to the vehicle's chassis or engine block, away from the battery. Do not connect the clamp to the carburettor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or the engine block.
- g. When disconnecting the charger, disconnect the AC cord, remove the clamp from the vehicle's chassis, and then remove the clamp from the battery terminal.
- h. See the 'Length of Charge' section for additional guidance.

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

- a. Only connect/disconnect DC output clamps when the charger is switched off and unplugged. Never allow clamps to touch each other.
- b. Connect the POSITIVE (RED) charger clamp to the POSITIVE (POS, P, +) post of the battery.
- c. Position yourself and free end of cable as far away from battery as possible - then connect the NEGATIVE (BLACK) charger clamp to free end of cable.
- d. Do not face the battery when making the final connection.
- e. When disconnecting the charger, always do so in the reverse sequence of connecting it and take off the first connection as far away from the battery as practical.
- f. A marine (boat) battery must be removed and charged on shore, charging it on board requires specially designed equipment, for marine use.

AC POWER CORD CONNECTION INSTRUCTIONS:

DANGER. Never alter the AC cord or plug provided - if it will not fit the outlet, seek professional advice from a qualified electrician. Improper connection can result in a risk of electric shock.

LENGTH OF CHARGE

The following instructions will allow you to determine how long it will take to bring your battery to full charge.

- a. Test the battery's charge with a hydrometer or electronic 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 charge time.
- c. Use the battery's rating and charge level, together with the amp setting to be used on the charger in the formula below:

$$\frac{\text{Amp Hour Rating of Battery} \times \text{Percent of Charged Needed}}{\text{Amp Setting Selected On Charger}} \times 1.3 = \text{Hours to Charge}$$

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

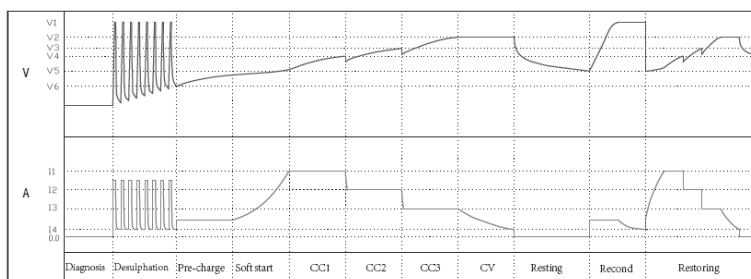
CHARGING

NOTE: Before using the charger, please review all safety and connection directions. Failure to do so can damage the battery and cause serious injury or death.

- Connect the charger to the battery per the operating instructions.
- Connect the charger to an AC outlet.
- Select the appropriate charging mode for your battery.
- If the charger does not detect a properly connected battery, the Reverse Polarity Indicator LED will light or an Error Code will appear on the LCD display until a properly connected battery is detected. Charging will not begin while the Reverse Polarity Indicator LED is on or an error code is displayed. When charging begins, the 'Charging Progress' icon on the LCD display will be lit.
- When charging is complete, unplug the charger from the AC outlet first and then disconnect the battery from the charger.

AUTOMATIC CHARGE MODE:

The charger uses a proprietary 9-stage charging process designed to optimally charge and maintain batteries. (The below chart and illustration show the charging routine when charging a 12V deeply discharged battery in mode 3).



Stage 1 — Diagnosis: The battery is analysed to ensure it can be charged, so as to prevent charging a defective battery. If the battery voltage is 0V-0.5V, the charger assumes there is a wrong connection; 0.5V-1.5V the battery is defective; 1.5V-12V, the pre-charge stage will begin; 12V-14V, Constant Current charging stage will begin; 14V-15V the battery is fully charged; If the battery is >15V, the charger assumes there is a bad connection.

Stage 2 — Desulphation: If the battery was sulfurized, the charger will clear the sulphide by higher current and voltage to recover battery capacity.

Stage 3 — Pre-charge: If the battery voltage is less than 12V, charge it at the smaller current, which will protect the battery better;

Stage 4 — Soft start: Charge the battery to the maximum current gradually and never suddenly.

Stage 5 — CC1,CC2,CC3 (Constant current): The charger automatically adjusts the current according to the battery status in constant current, which benefits the battery for a long life;

Stage 6 — Constant voltage (CV) absorption charging stage. The charging voltage remains at 14.6V, but the charging current reduces gradually until the battery is fully charged.

Stage 7 — Resting: When the battery is fully charged, the charger cuts off.

Stage 8 — Reconditioning: If the battery voltage falls fast after being fully charged, it indicates

a reduction in battery capacity. The charger will then charge at a higher voltage to recover the battery's capacity.

Stage 9 — Restoring: Automatic on-off monitoring. The charger monitors a fully charged battery. If the battery falls below 12.8V DC, the charger will restart and enter stage one charging again.

ADDITIONAL FEATURES

a. Reverse Polarity Protection

The REVERSE POLARITY INDICATOR LED will light and the charger will cut out if a reverse connection is detected.

b. Short Circuit Protection

If the charger detects less than 0.5V across the clamps it will cut out and display the error code "Er1". Please see TROUBLESHOOTING ERROR CODES.

c. Over-voltage Protection

If the charger is set to charge at a different voltage than the detected voltage of the battery, 'Over-Voltage Protection' will be engaged. The error code "Er1" will be displayed. Please see TROUBLESHOOTING ERROR CODES.

d. Battery Diagnostics Function

The charger continuously monitors the battery's condition and may report certain charging failures as fault codes. The error codes "Er1" or "Er2" will be displayed. Please see TROUBLESHOOTING ERROR CODES.

Errors occur if: the battery voltage does not rise as expected during the charging process (indicating a shorted cell) or if the maximum charge time has been exceeded, etc.

e. Battery Reconditioning Function

If a battery is discharged deeply, it may be sulphated and unable to accept a charge. The reconditioning function may help restore a battery's ability to accept a charge. The charger will automatically diagnose this situation and if successful normal recharging will resume, after the battery has been de-sulphated. If unsuccessful at de-sulphating the battery error code "Er2" will be displayed. Please see TROUBLESHOOTING ERROR CODES.

f. Overheat Protection

If it overheats the charger is designed to decrease the charging current or even shut itself off. Once the charger cools down, it will resume charging automatically. Error code "Er3" will be displayed. Please see TROUBLESHOOTING ERROR CODES.

g. Mode-setting Memory Function

With its mode-setting memory function the charger can enter the mode that it was last set to. This function can reduce the worry about forgetting battery settings and reduce set up time.

TROUBLESHOOTING ERROR CODES

Code	Condition	Possible Cause	Solution
Er1	The battery voltage is less than 0.5V before charging.	The battery is defective.	Replace the battery.
	Charging does not begin.	The battery clamps are disconnected from the battery. The battery clamps are connected to each other.	Connect the battery firmly and correctly.
		The battery voltage is not matched to the selected mode.	Confirm that the battery voltage is matched with the mode.
Er2	The battery voltage is 0.5V - 1.5V before charging.	The battery is defective.	Replace the battery.
	The battery voltage is less than 11V after 4 minutes of charging. The battery is not fully charged after 24-hours of charging.	The battery is defective.	Replace the battery.
		A load may be connected to the battery.	Disconnect the load and attempt to charge again.
		The charge current is too low.	Select a higher charge rate.
	The battery voltage is less than 12V in 2 minutes after full charged.	The battery is sulphated beyond reconditioning.	Replace the battery.
Er3	The temperature of the charger is too high.	High ambient temperature.	Ensure adequate ventilation. The charger will resume charging after cooling.

MAINTANENCE INSTRUCTIONS

This charger requires minimal maintenance, though 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.

TECHNICAL DATA

Model	50904
Input	220 - 240V AC 0.8A 50/60Hz
Output	6V --- 2A. 12V --- 2A/4A
Battery Voltage	6V/12V DC
Charging Current	2A/4A
Dimensions (L x W x H)	15.4 x 8.2 x 4.4 (cm)
Weight	0.5 kg

WARRANTY AND RETURN

What does this warranty cover? This limited warranty is provided by Custom Accessories Europe and covers defects in workmanship and materials in your model 50904 battery charger. This warranty period lasts for 12 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 Custom Accessories Europe do? Custom Accessories Europe will, at its option, repair or replace the defective product free of charge, provided that you notify Custom Accessories Europe of the product defect within the Warranty Period, and provided that Custom Accessories Europe, through inspection, establishes the existence of such a defect and that it is covered by this limited warranty. Custom Accessories Europe will, at its option, use new and / or reconditioned parts in performing warranty repairs and building replacement products. Custom Accessories Europe reserves the right to use parts or products of original or improved design in the repair or replacement. If Custom Accessories Europe 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 Custom Accessories Europe. Custom Accessories Europe covers both parts and labour necessary to repair the product, and return shipment to the customer via our Help-Line Centre for all UK resident customers.

Please return with proof of purchase to Cobalt Innovations Ltd, Energizer Warranty Dept., Unit 30-31 Lagrange, Lichfield Road Industrial Estate, Tamworth, B79 7XD. This does not affect your statutory rights.

How do you get service? If your product requires troubleshooting or warranty service, call the CAE Help-Line number: 0800 5420825

What does this warranty not cover? This limited warranty does not cover normal wear and tear of the product or costs related to the removal, installation, or troubleshooting of the customer's electrical systems.

This warranty does not apply to, and Custom Accessories Europe will not be responsible for, any defect in or damage to:

1. The product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment.
2. The product if it has been subjected to fire, water, generalised corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Custom Accessories Europe product specifications including high input voltage from generators and lightning strikes.
3. The product if repairs have been done to it other than by the CAE warranty department.
4. The product if it is used as a component part of a product expressly warranted by another manufacturer.
5. The product if its original identification (trade-mark, serial number) markings have been defaced, altered, or removed.

Exclusions

This limited warranty gives you specific legal rights. This does not affect your statutory rights.

Warning: Limitations on use

Please read this product manual for limitations on use.

RETURN PROCEDURE

1. Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging.
2. Include the following:
 - A return address where the unit can be shipped. Post office boxes are not acceptable.
 - A contact telephone number where you can be reached during work hours.
 - The serial number of your product.
 - Information about the installation and use of the unit.
 - Information about the failure and / or reason for the return.
 - A copy of your dated proof of purchase.
3. Ship the unit prepaid to our CAE warranty department.

Made in China for:
Custom Accessories Europe Ltd,
The Granary, Standen Manor, Hungerford, RG17 0RB, UK

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All battery chargers have been tested and approved to the following standards:
EN 60335
EN 55014
EN 61000

EBC10117