

GUDETEK

Battery Charger User Guide

MODEL: CS-7000

AC Input: 220-240VAC, 50-60Hz, 1.0A

DC Output: 6VDC, 5A;

12VDC, 7A;

24VDC, 3.5A;

Temperature Controlled



Please read and understand all important safety and operating instructions before using this charger. In addition, please read and follow all battery and vehicle manufacturer's instructions and cautionary markings.

IMPORTANT SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS FOR WORKING IN THE VICINITY OF A BATTERY

- 1) Batteries generate explosive gases during normal operation. Use in well-ventilated area.
- 2) Consider having someone close enough or within the range of your voice to come to your aid when you work near a battery.
- 3) Do NOT smoke, strike a match, or cause a spark in vicinity of battery or engine. Avoid explosive gas, flames and sparks.
- 4) Remove all personal jewelry, such as rings, bracelets, necklaces, and watches while working with a vehicle battery. These items may produce a short-circuit that could cause severe burns.
- 5) Be extra cautious to reduce risk of dropping a metal tool onto the battery. It might spark or short-circuit a battery or other electrical hardware which may cause an explosion or fire.
- 6) Wear complete eye protection, hand and clothing protection. Avoid touching eyes while working near a battery.
- 7) Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- 8) Clean battery terminals before connected with the charger. Be careful to keep corrosion from coming in contact with eyes.
- 9) When it is necessary to remove a battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.
- 10) It is NOT intended to supply power to an extra-low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may burst and cause injury to persons and property.
- 11) NEVER charge a frozen, damaged, leaking or non-rechargeable battery.
- 12) If battery electrolyte contacts skin or clothing, wash immediately with soap and water. If electrolyte enters eye, immediately flood eye with running clean cold water for at least 15 minutes and get medical attention immediately.

SAFETY PRECAUTIONS FOR USING THE CHARGER

- 1) Do NOT place the charger in the engine compartment or near moving parts or near the battery; place as far away from them as DC cable permits. NEVER place a charger directly above a battery being charged; gases or fluids from battery will corrode and damage charger.
- 2) Do NOT cover the charger while charging.
- 3) Do NOT expose to rain or wet conditions.

- 4) Connect and disconnect DC output only after setting AC cord from electric outlet.
- 5) Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock or injury to persons.
- 6) Do not overcharge batteries by selecting the wrong charge mode.
- 7) To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting charger.
- 8) To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.
- 9) Operate with caution if the charger has received direct hit of force or been dropped. Have it checked and repaired if damaged.
- 10) Any repair must be carried out by the manufacturer or an authorized repair agent in order to avoid danger.

CONNECTING TO THE BATTERY

- 1) Identify polarity of battery posts. The positive battery terminal is typically marked by these letters or symbol (POS,P,+). The negative battery terminal is typically marked by these letters or symbol (NEG,N,-).
- 2) Do not make any connections to the carburetor, fuel lines, or thin metal parts.
- 3) Identify if you have a negative or positive grounded vehicle. This can be done by identifying which battery post (NEG or POS) is connected to the chassis.
- 4) For a negative grounded vehicle (most common): connect the RED POSITIVE battery clamp first to the positive battery terminal, then connect the BLACK NEGATIV battery clamp to the negative battery terminal or vehicle chassis.
- 5) For a positive grounded vehicle (very uncommon): connect the BLACK NEGATIV battery clamp first to the negative battery terminal, then connect the RED POSITIVE battery clamp to the positive battery terminal or vehicle chassis.
- 6) When disconnecting, disconnect in the reverse sequence, removing the negative first (positive first for positive ground systems).

NOTICE: If battery clamps are reversely connected to battery terminals, the ERROR LED will be on. Exchange the battery clamps to solve this problem.

ABOUT CS-7000

- 1) The CS-7000 is designed for charging all types of 6V lead-acid, 12V lead-acid and 24V lead-acid batteries, including WET (Flooded), MF (Maintenance-Free), EFB (Enhanced Flooded Battery), GEL, AGM (Absorbed Glass Mat) batteries. It is suitable for charging


battery capacities from 14 to 230 Amp-Hours and maintaining all battery sizes.

- 2) Built-in intelligent microprocessor makes charging faster, easier and safer.
- 3) This charger has safety features, including spark proof, protection for reverse polarity, short circuit, overheat, overcharge and over current.
- 4) It has auto-memory, which returns to last selected mode when restarted (except Standby and Supply Modes).
- 5) When the CHARGING LED is on, it is on charging; when the CHARGING LED is off and CHARGED LED is on, the charging is completed. But do NOT break the connection immediately. It will automatically switches from full charge to maintenance status without overcharging or damaging the battery.
- 6) The CS-7000 has four external holes for mounting. Mount the charger in a desired location with equipped self-drill screws. It is important to keep in mind the distance to the battery. The DC cable length from the charger is approximately 75 inches (1900mm).
- 7) Following is the charger's technical specification:

AC Input	220-240VAC, 50- 60Hz, 1.0A;
DC Output	6VDC, 5A; 12VDC, 7A; 24VDC, 3.5A; Temperature Controlled
Power (IN)	Variable Power, 120W Max
Efficiency	85% Approx
Back Current Drain	<5mA
Ambient Temperature	0°C ~ +40°C
Charger Type	8 steps, Full-automatic Charging Cycle
Battery Type	All Types of 6V, 12V and 24V Lead-acid Batteries
Battery Capacity	14-150Ah (6V), 14-230Ah (12V), 14-115Ah (24V), Maintains All Battery Sizes
Housing Protection	IP54
Accessories Included	Cable Clamps, 12V SUPPLY Cigarette Lighter Outlet, and extra Fuse&Screws
Other Features	Intelligently enter Norm / Cold Mode, 8-hour Repair Process if battery voltage is too low (only for 12V and 24V Mode), And 13.6V/5A Supply Mode

CHARGING MODES


CS-7000 has seven (7) modes: Standby, 6V, 12V, 24V, 12V REPAIR, 24V REPAIR and 13.6V SUPPLY. Choosing to charge or repair, the switch sequence is 6V -- 12V -- 24V -- 12V REPAIR -- 24V REPAIR, and then repeat. Do not operate the charger until you confirm the appropriate charge mode for your battery. **CAUTION:** If you choose 24V Mode(s) for 6V/12V battery, the 6V/12V battery will be damaged!

Mode	Battery Size (Ah)	Explanation
Standby	---	Not charging or providing any power ( LED is on)
6V	14-150	Charging 6V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T > 0^{\circ}\text{C}$ or $T < 0^{\circ}\text{C}$)
12V	14-230	Charging 12V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T > 0^{\circ}\text{C}$ or $T < 0^{\circ}\text{C}$)
24V	14-115	Charging 24V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T > 0^{\circ}\text{C}$ or $T < 0^{\circ}\text{C}$)
12V REPAIR	14-230	An advanced battery recovery mode for repairing old, idle, stratified or sulfated 12V batteries (12V Mode LED flashing)
24V REPAIR	14-115	An advanced battery recovery mode for repairing old, idle, stratified or sulfated 24V batteries (24V Mode LED flashing)
13.6V SUPPLY	---	Converting to a 13.6V power source for charging a DC device or as a power source for a battery (CHARGE LED flashing)

Following modes are the advanced modes that repair

CHARGING MODES

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Mode	Battery Size (Ah)	Explanation
Standby	—	Not charging or providing any power ( LED is on)
6V	14-150	Charging 6V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T < 0^{\circ}\text{C}$ or $T > 0^{\circ}\text{C}$)
12V	14-230	Charging 12V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T < 0^{\circ}\text{C}$ or $T > 0^{\circ}\text{C}$)
24V	14-115	Charging 24V lead-acid batteries according to the ambient temperature with intelligent compensation charge ($T < 0^{\circ}\text{C}$ or $T > 0^{\circ}\text{C}$)
12V REPAIR	14-230	An advanced battery recovery mode for repairing old, idle, stratified or sulfated 12V batteries (12V Mode LED flashing)
24V REPAIR	14-115	An advanced battery recovery mode for repairing old, idle, stratified or sulfated 24V batteries (24V Mode LED flashing)
13.6V SUPPLY	—	Converting to a DC power supply for powering 12V DC device or as a memory retainer when replacing a battery (CHARGED LED flashing)

Following modes are the advanced modes that require your full attention before selecting.

Using REPAIR

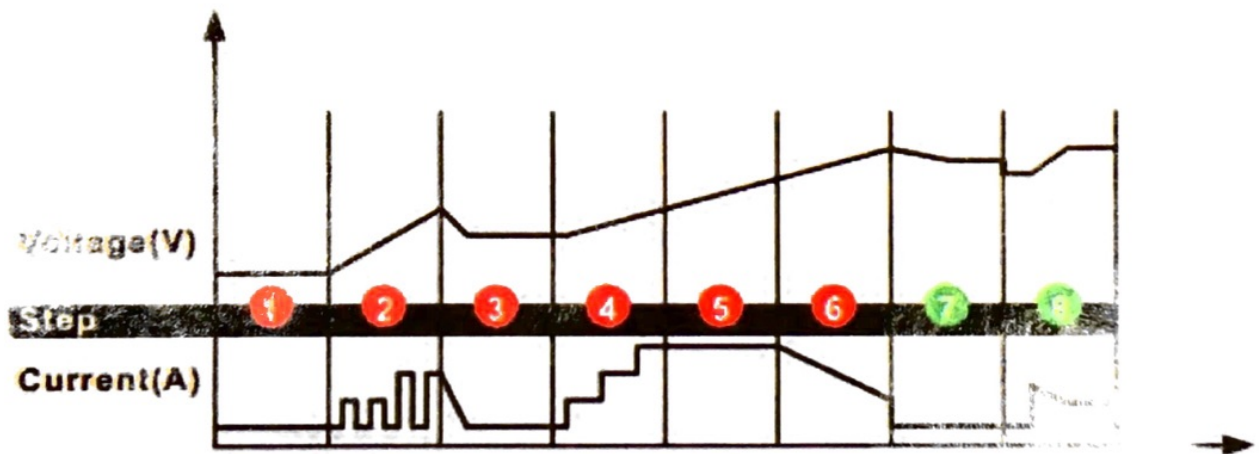
This mode is for LEAD-ACID batteries only. It is an advanced battery recovery mode for repairing old, idle, stratified or sulfated batteries. NOT all batteries can be recovered. For optimal results, take the battery through a full charge cycle, bringing the battery to full

charge, before using this mode. One REPAIR cycle can take up to **eight (8) hours** to complete the recovery process and will enter to charge (8 steps charging cycle) when completed. This mode uses a high charging voltage and may cause some water loss in WET (flooded) cell batteries. Plus, some batteries and electronics may be sensitive to high charging voltages. To minimize risks, disconnect the battery from the vehicle before using this mode.

Using 13.6V SUPPLY

When the charger is not connected with battery, press & hold Mode button for 3 seconds to enter Supply Mode. This mode converts the charger to a constant voltage, constant current DC power supply. When the charger is not connected with battery, it can be used to power 12VDC devices. Prior to use, read your 12VDC device manual to determine if it is suitable for use with this mode. As a power supply, it can also be used to retain a vehicle's on-board computer settings during battery repair or replacement. 13.6V Supply Mode provides 13.6V at 5A with overload protection at 6A (Max). Both spark proof and reverse polarity protection are disabled in this mode. Do NOT allow the positive and negative battery clamp to touch or connect to each other as the charger could generate sparks.

CHARGING STEPS



STEP 1: DIAGNOSIS (Check if battery has connected with the charger and check battery voltage)

STEP 2: DESULPHATION (If battery voltage is too low, programs automatically generate pulsing current to remove sulphate, **up to 5 hours**)

STEP 3: ANALYSE (Check if the battery voltage reaches to the threshold after desulphation, and charging begins if the battery voltage is OK)

STEP 4: SOFT START (Charge with echelon constant current)

STEP 5: BULK (Charge with constant maximum current until battery voltage is reached to the threshold)

STEP 6: ABSORPTION (Provide gradually declining current charge for maximum battery voltage)

STEP 7: ANALYSE (Test if the battery can hold charge)

STEP 8: MAINTENANCE (Continuously monitor the battery, and charging current will intelligently adapt to the variable battery voltage).

CHARGING TIME

Different battery capacity and residual voltage would affect the charging time. Following data is only for reference (when discharge 12V lead-acid battery to 9V, with 5A discharge current; when discharge 24V lead-acid battery to 18V, with 10A discharge current).

Battery Size/Ah	Approx. Time to Charge in Hours (12V)		Approx. Time to Charge in Hours (24V)	
	50	5H @ 14.5V	7H @ 14.7V	9H @ 29.3V
60	8H @ 14.4V	10H @ 14.7V	11H @ 29.5V	14H @ 30V
100	9H @ 14V	15H @ 14.5V	19H @ 29.3V	24H @ 30V
150	21H @ 14V	25H @ 14.8V	25H @ 29.5V	28H @ 30V
200	24H @ 14V	30H @ 14.7V	32H @ 28.3V	38H @ 30V

LED COMMUNICATION OF ABNORMAL RESULTS

No.	LED(S) CONDITION	CAUSE(S)	SOLUTION(S)
1	Solid Red Warning! LED	Reverse Polarity	Exchange the red and black clamps to the correct battery posts
2	Flashing Red Warning! LED	1) Capable of charging 2) Dirty Battery Posts 3) Dead Battery 4) Output Short Circuit	1) Connect the red and black clamps to the battery posts 2) Clean the battery posts 3) Replace the battery with a fully charged battery 4) Check the output terminals for any short circuit
3	Slowly flashing Red Warning! LED	Charging in 6V/12V Mode(s) for 24V battery;	1) Press the Mode(s) button 2) Mode(s) button

	+ Solid corresponding charging mode (6V/12V) LED	or charging in 6V Mode for 12V battery	correct charge mode.
4	Flashing CHARGING LED + Flashing CHARGED LED	Overheat protection	Current reduces when temperature in charger is too high. After cooling down, charge will begin
5	Flashing 12V LED	In 12V REPAIR Mode	-----
6	Flashing 24V LED	In 24V REPAIR Mode	-----
7	Solid Red Warning! LED + Flashing CHARGED LED	Overload in SUPPLY Mode (will automatically shut down for 30 seconds as protection)	Disconnect the external device
8	Quickly flashing Red Warning! LED + Solid corresponding charging mode (6V/12V/24V) LED	Battery cannot store electric charge during charging process	Replace the battery with a new one immediately
9	Slowly flashing corresponding charging mode (6V/12V/24V) LED	In Desulphation	-----
10	Red Warning! LED flashes 2x stop for 3secs, 2x stop for 3 secs...	1) Battery cannot be recovered through Desulphation 2) Battery cannot be recovered through Repair Mode	1) If battery cannot be recovered through Desulphation, try REPAIR Mode for recovery 2) Replace with a new battery
11	Quickly flashing corresponding charging mode LED	Heavily Corroded Battery	Replace with a new battery or try REPAIR Mode for recovery

NOTICE: following situation indicates that battery need to be replaced, although there is no abnormal result LED communication.

After full charging cycle with CHARGED LED is on, use this battery to start matched vehicle's engine. If engine cannot be activated (exclude the problem of vehicle itself), it indicates this battery has declined storage capacity and need to be replaced or try REPAIR Mode for recovery.

WARRANTY

- 1) This product is warranted to the original purchaser for a period of two (2) years from the original shipping date, to be free of defects in material and workmanship.
- 2) Warranty Performance: During the above two (2) years warranty period, a product with a defect will be replaced with a new one when the product is returned to the manufacturer. The replacement product will be in warranty for the balance of the original two (2) years warranty period.
- 3) This warranty is void if the product has been damaged by accident, in shipment, unreasonable use, misuse, neglect, improper service, commercial use, repairs by unauthorized personnel or other causes not arising out of defects in materials or workmanship.