Battery Charger User Guide

MODEL: CN-4000
AC Input: 220-240VAC, 50-60Hz, 0.8A
DC Output: 12VDC, 4A;
6VDC, 4A;
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 (or 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 CN-4000

1) The CN-4000 is designed for charging all types of 6V lead-acid and 12V 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 1.2 to 130 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 and overcharge.

4) It has auto-memory, which returns to last selected mode when restarted (except Repair Modes).

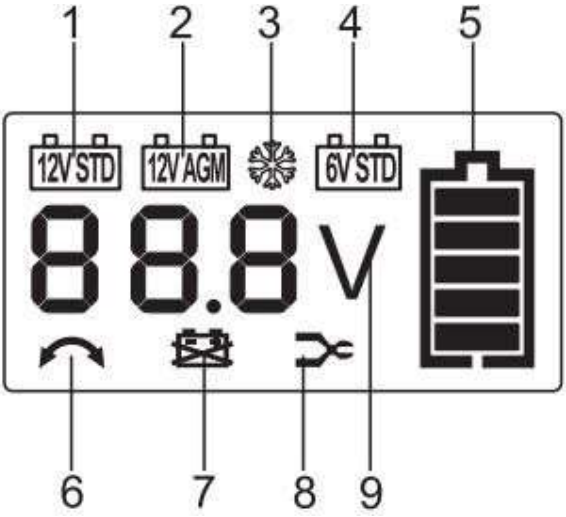
5) When the battery level indicator bars are flashing, it is on charging; when 5 bars are solid, the charging is completed. But do NOT break the connection immediately. It will automatically switches from full charge to maintenance status without overcharging or damaging the battery.

6) 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, 0.8A;
DC Output	12VDC, 4A; 6VDC, 4A; Temperature Controlled
Power (IN)	Variable Power, 60W Max
Efficiency	85% Approx
Back Current Drain	<5mA
Ambient Temperature	0□ ~ +40□
Charger Type	8 steps, Full-automatic Charging Cycle
Battery Type	All Types of 6V and 12V Lead-acid Batteries
Battery Capacity	1.2-130Ah (12V), 1.2-130Ah (6V), Maintains All Battery Sizes
Housing Protection	IP54
Accessories Included	Cable Clamps
Other Features	Norm / Cold Mode, and 8-hour Repair Process if battery voltage is too low (only for 12V Mode)

8) LCD Icons:



1) 12V STD Mode
2) 12V AGM Mode
3) COLD Mode
4) 6V STD Mode
5) Battery Level Indicator
6) Reverse Polarity Connection Indicator
7) Faulty Battery Indicator
8) Clamp Indicator (Open-circuit / Dirty battery posts / Dead battery / Output Short Circuit)
9) Battery Voltage Indicator (press & hold Mode button for 3 seconds to display the battery's voltage)

CHARGING MODES

CN-4000 has ten modes (sel): Standby, 12V STD, 12V COLD, 12V AGM, 12V AGM+COLD, 6V STD, 12V STD Repair, 12V COLD Repair, 12V AGM Repair and 12V AGM+COLD Repair. Do not operate the charger until you confirm the appropriate charge mode for your battery. **CAUTION:** If you choose 12V Mode(s) for 6V battery, the 6V battery will be damaged!

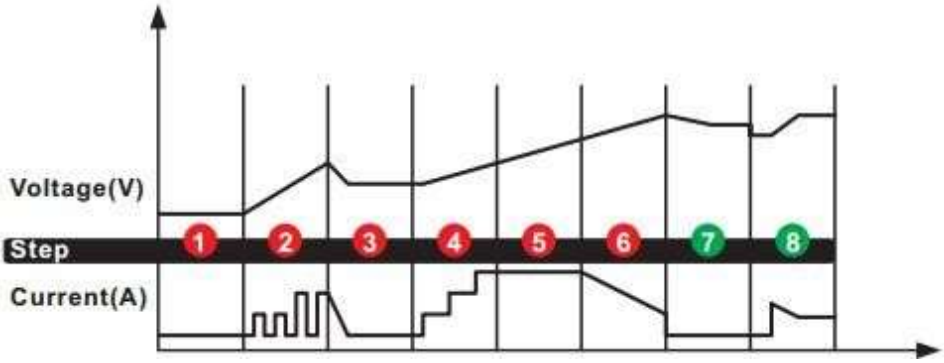
Mode	Icon Display	Battery Size (Ah)	Explanation
Standby	------	------	Not charging or providing any power (LCD screen turns black and Green LED is on)
12V STD	Keep on	1.2-130	Charging 12V WET/GEL/MF/EFB batteries
12V STD	Keep on	1.2-130	Charging 12V WET/GEL/MF/EFB batteries below 10□ (50□)
12V AGM	Keep on	1.2-130	Charging 12V AGM batteries
12V AGM	Keep on	1.2-130	Charging 12V AGM batteries below 10□ (50□)
6V STD	Keep on	1.2-130	Charging 6V WET/GEL/MF/EFB/AGM batteries
12V STD	Flash	1.2-130	Repairing 12V STD batteries
12V STD	Flash	1.2-130	Repairing 12V STD battery below 10□ (50□)
12V AGM	Flash	1.2-130	Repairing 12V AGM batteries

12V AGM	Flash	1.2-130	Repairing 12V AGM batteries below 10□ (50□)

Using 12V 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. When this mode is chosen, do remember press Mode button for choosing appropriate 12V Mode(s). 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.

CHARGING STEPS



STEP 1: DIAGNOSIS (Check if battery has connected with the charger and also 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

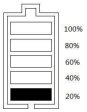
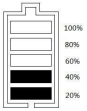
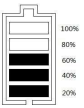
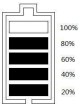
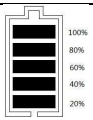
to the threshold)

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).

BATTERY LEVEL INDICATOR

Display	Explanation
	The 20% bar will slowly flash when the battery level is less than 20%. When 20% is reached, the bar will be solid.
	The 40% bar will slowly flash when the battery level is less than 40%. When 40% is reached, the bar will be solid.
	The 60% bar will slowly flash when the battery level is less than 60%. When 60% is reached, the bar will be solid.
	The 80% bar will slowly flash when the battery level is less than 80%. When 80% is reached, the bar will be solid.
	The 100% bar will slowly flash when the battery level is less than 100%. When 100% is reached, the bar will be solid. Meanwhile the maintenance charging is activated.

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.

Battery Size/Ah	Approx. Time to Charge in Hours (12V)	
20	5H @ 14.4V	7H @ 14.7V
40	8H @ 14.6V	11H @ 14.9V
60	9H @ 14.4V	12H @ 14.7V
75	14H @ 14.5V	17H @ 14.7V
100	16H @ 14.4V	20H @ 14.7V

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.