

# BATTERY CHARGER

## 12V/6V, 50A Battery Charger & Engine Starter

12V / 6V, 50A Cargador de batería y motor de arranque

Model/Modelo SBC-50

Temperature Controlled



### CAUTION:

Read and follow all safety rules and operating instructions before every use of this product.  
SAVE THESE INSTRUCTIONS.

### ATENCIÓN:

Lea y siga todas las reglas de seguridad e instrucciones de uso antes de cada uso de este producto.  
GUARDE ESTAS INSTRUCCIONES.

# IMPORTANT SAFETY INSTRUCTIONS

**WARNING!** Read and understand all Important Safety and Operating instructions before using this charger. In addition, read and follow all battery and vehicle manufacturer's instructions and cautionary markings.

## **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 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. This product 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.

**⚠ WARNING:** This Product contains chemicals including SCCP, PAHs, DBP, DEHP, BBP, DBP, DIBP which are known to the State of California to cause cancer, birth defects or other reproductive harm. For more information, go to - [www.P65Warning.ca.gov](http://www.P65Warning.ca.gov)  
Wash hands after handling.

## GROUNDING AND AC POWER CORD CONNECTIONS

This battery charger is for use on a nominal 120 volt circuit. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. The plug pins must fit the receptacle (outlet). Do not use with an ungrounded system. Use of an adapter plug is not recommended; an adaptor plug should not be used.

### USING AN EXTENSION CORD

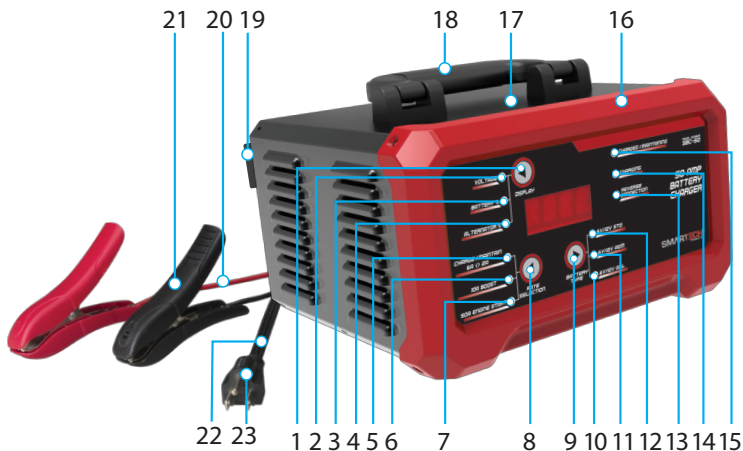
The use of an extension cord is not recommended. If you must use an extension cord, follow these guidelines:

1. Pins sockets on the extension cord plug must be the same number, size, and shape as those of plug on charger.
2. Ensure that the extension cord is properly wired and in good electrical condition.
3. Wire size must be large enough for the AC ampere rating of the charger, as specified on the next page:

Length of cord (feet)	25	50	100	150
AWG* size of cord	18	16	14	12

\*AWG-American Wire Gauge

## FEATURES



1. DISPLAY BUTTON	15. CHARGED/MAINTAINING LED indicator
2. Voltage LED indicator	16. Function display panel
3. Battery % LED indicator	17. Metal shell
4. Alternator % LED indicator	18. Handle
5. 6<>2A CHARGE/MAINTAIN LED indicator	19. Cable base
6. 10A BOOST LED indicator	20. DC cord
7. 50A ENGINE START LED indicator	21. Battery clamp
8. RATE SELECTION BUTTON	22. AC cord
9. BATTERY TYPE BUTTON	23. AC plug
10. GEL LED indicator	
11. AGM LED indicator	
12. STANDARD LED indicator	
13. REVERSE CONNECTION LED indicator	
14. CHARGING LED indicator	

1. This product 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.
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 overcurrent.
4. Charging start-up threshold is 1V.
5. During maintaining process, the output current is 0.5A for 1S, 1.5A for 1S, 1.5A for 1S (PULSE).....Repeat.
6. The charger has a clamp storage panel on the back.





## CHARGER TECHNICAL SPECIFICATIONS

AC Input	120VAC,60Hz, 3.5A MAXIMUM CONTINUOUS, 12A MAXIMUM INTERMITTENT.
DC Output	<b>Charge:</b> 6VDC, 2A CONTINUOUS; 12VDC, 2A-120 SECONDS, 6A-60 SECONDS. <b>Boost:</b> 6/12VDC, 10A CONTINUOUS. <b>Engine Start:</b> 12VDC, 50A INTERMITTENT 10 SECONDS ON, 180 SECONDS OFF. Temperature Controlled
Charger Type	4 step, Fully automatic charging cycle
Start Voltage	> 1V
Housing Protection	IP20
Battery Type	All Types of 6V and 12V Lead-acid Batteries
Battery Capacity	4-200Ah (6V/12V) Maintains all battery sizes
Accessories Included	Clamp Connectors
Ambient Temperature	32°F – 104°F (0°C – 40°C)

## DISPLAY MESSAGES

**Startup** – Display screen and all LEDs illuminate for 0.5 second.

“SMARTECH” text will scroll across the display twice followed by “NO CONNECT” text (if nothing is connected to the charger).

**TESTING** is shown on digital screen, battery voltage shows (meanwhile battery VOLTAGE LED is lit).

## DISPLAY BUTTON

Digital display	LED indicator	Description
Battery-voltage	Voltage LED lit	When the charger is NOT charging a battery, the display will show the battery VOLTAGE (Voltage value / Alternator% value / <b>OFF</b> in turn by pressing DISPLAY button). When charging <b>BATT-06V</b> or <b>BATT-12V</b> is shown by pressing DISPLAY button.
Battery - %	Battery % LED lit	When in charging, the digital display shows an estimated charge percentage of the battery connected to the charger's battery clamps. If battery voltage is too low, the display will show <b>LO</b> instead of percentage.
Alternator - %	Alternator % LED lit	The digital display shows an estimated output percentage of the vehicle's charging system connected to the charger's battery clamps, compared to a properly functioning system. The alternator percent range is from 0% to 100%. Readings below 0% (13.2 volts) will read LO and readings above 100% (14.6 volts) will read HI. If you get a HI or LO reading, have the electrical system checked by a qualified technician.

## BATTERY TYPE BUTTON

Digital display	LED indicator	Description
CHARGING	6V /12V <b>STD</b> LED lit	Charging 6V and 12V WET/MF/EFB batteries. During charging, pressing BATTERY TYPE button is void.
CHARGING	6V / 121V <b>AGM</b> LED lit	Charging 6V and 12V AGM batteries. During charging, pressing BATTERY TYPE button is void.
CHARGING	6V / 12V <b>GEL</b> LED lit	Charging 6V and 12V GEL batteries. During charging, pressing BATTERY TYPE button is void.

## RATE SELECTION BUTTON

After testing the battery, the charger will go into the OFF mode. You can choose the following option to make your desired selection. In order to come back to OFF mode, you need to press the RATE SELECTION button once while you are in other modes.

**6<>2A CHARGE/MAINTAIN** (press RATE SELECTION button once to enter based on OFF mode) – For charging small and large batteries. Not recommended for industrial applications. For 12V type battery, if battery voltage is over 13.5V, the maximum output is 2A instead of 6A; for 6V type battery, the maximum output is 2A.

Digital display	LED indicator	Charging state
CHARGING	CHARGING LED lit	The charger is charging the battery.
CHARGED	CHARGED/ MAINTAINING LED lit	The battery is fully charged.
MAINTAINING	CHARGED/MAIN- TAINING LED lit	The charger is maintaining the battery.

**10A BOOST** (press RATE SELECTION button twice to enter based on OFF mode) – This setting can be used for a quick boost, prior to using the engine start setting. When Boost mode ends, VOLTAGE LED will illuminate and display screen will show battery voltage, and meanwhile BOOST LED will flash. Boost does NOT make battery fully charged. You can select CHARGE/MAINTAIN mode by pressing RATE SELECTION button to continue to charge the battery.

**50A ENGINE START** (press RATE SELECTION button three times to enter based on OFF mode) – Provides additional amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery for ENGINE START mode. Must NOT touch or disconnect clamps when ENGINE START mode works, otherwise there may be serious injuries to people or property.

**NOTE:**

1. When entering CHARGE/MAINTAIN or BOOST, the charger will automatically detect 6V or 12V in ten seconds (display shows **ON**, then **ANALYSING-1**). After **BATT-06V** or **BATT-12V** is showed on digital screen, **CHARGING** will show (charging has started).
2. If RATE SELECTION button is not pressed in the starting 10 minutes, the charger will automatically begin charging with 6V/12V STD and 6<>2A CHARGE/MAINTAIN if a battery is connected.

**ERROR SITUATIONS**

Digital display	Warning LED indicator	Explanation
<b>REVERSED</b>	REVERSE CONNECTION LED lit	The connections are reversed.

<b>NO-CONNECT</b>	/	No battery connected / battery voltage is lower than 1 volt (dead battery) / red and black clamps are connected together.
<b>OVER-TEMP</b>	/	Output current reduces to 0 when temperature in charger is too high (exceeds 269.6°/132°). After cooling down for a few minutes, the charger will automatically begin charging with 6<>2A CHARGE/MAINTAIN rate if a battery is connected, and the battery type has memory function and is the same as before.
<b>BAD-BATT</b>	/	The battery cannot store electric charge (dead battery) after 3-minute analysis ( <b>ANALYSING-2</b> Display).

## BATTERY CHARGING TIMES

**Ah** - Ampere Hours

**CCA** - Cold Cranking Amps

**RC** - Reserve Capacity

**MO** - Maintain Only

Use the following table to determine the time it will take to bring a battery to full charge.

BATTERY SIZE/RATING(6V/12V)			CHARGE RATE/TIME	
			6A<>2A (12V)	2A (6V)
SMALL BATTERIES		6-12 Ah	1½ - 2½ h	2½ - 7½ h
Motorcycle, garden tractor, etc.		12-32 Ah	2½ - 7½ h	7½ - 9½ h
CARS/ TRUCKS	200-315 CCA	40-60 RC	7½ - 9½ h	<b>MO</b>
	315-550 CCA	60-85 RC	9½ - 13½ h	<b>MO</b>
	550-1000 CCA	85-190 RC	<b>MO</b>	<b>MO</b>



MARINE/DEEP-CYCLE	80 RC	<b>MO</b>	<b>MO</b>
	140 RC	<b>MO</b>	<b>MO</b>
	160 RC	<b>MO</b>	<b>MO</b>
	180 RC	<b>MO</b>	<b>MO</b>

Times are based on a 50% discharged battery and may change, depending on age and condition of battery.

## 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** clamp first to the positive battery terminal, then connect the **BLACK NEGATIVE** clamp to the negative battery terminal or vehicle chassis.
5. For a positive grounded vehicle (very uncommon): connect the **BLACK NEGATIVE** clamp first to the negative battery terminal, then connect the **RED POSITIVE** 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).
7. A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

# OPERATING STEPS

Step no.	Step select key
<p>Step 1</p> <p>Correctly connect the charger to the battery</p>	/
<p>Step 2</p> <p>Confirm battery type</p>	
<p>Step 3</p> <p>Determine RATE SELECTION</p>	

**Note:** When the digital screen is only displayed as OFF, the charger can choose the corresponding mode by pressing RATE SELECTION button.

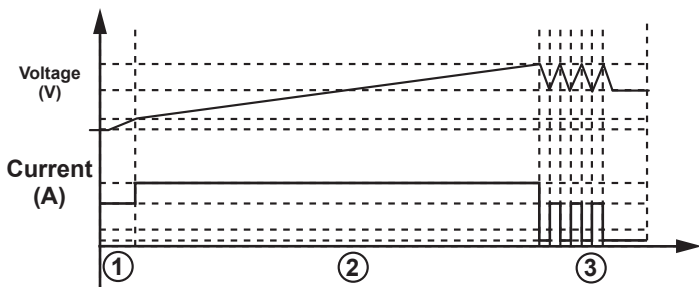
# CHARGING STEPS

During the 6V battery type charging process, the charger performs the following operations.

**STEP 1 – IDENTIFY VOLTAGE** Determines if the connected battery is 6V or 12V

**STEP 2 – CONSTANT CURRENT CHARGE** Charges the battery with constant current

**STEP 3 – MAINTENANCE** Analysis and maintaining process, the output current is 0.5A for 1S, 1.5A for 1S, 0.5A for 1S, 1.5A for 1S . . . repeat.





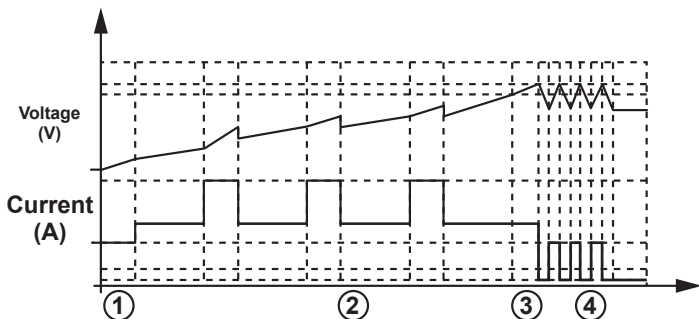
During the 12V battery type charging process, the charger performs the following operations.

**STEP 1 – IDENTIFY VOLTAGE** Determines if the connected battery is 6V or 12V

**STEP 2 – MULTI CYCLICAL CHARGE** Charges the battery with two kinds of cyclical constant current

**STEP 3 – ABSORPTION** Provides constant small current charge for absorption

**STEP 4 – MAINTENANCE** Analysis and maintaining process, the output current is 0.5A for 1S, 1.5A for 1S, 0.5A for 1S, 1.5A for 1S . . . repeat.



## ENGINE START FUNCTION

Your battery charger can be used to jump start your car if the battery is low. Follow all safety instructions and precautions for charging your battery. Wear complete eye protection and protective clothing. The procedures are as follows.

1. With the charger unplugged from the AC outlet, connect the charger to the battery following the instructions given in the **CONNECTING TO THE BATTERY** section.
2. Plug the charger AC power cord into the AC outlet. With the charger plugged in and connected to the battery and chassis, press the **RATE SELECTION** button until the **ENGINE START** LED is lit.  
**NOTE:** During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.
3. Crank the engine until it starts or 3 seconds pass. If the engine does not start, wait 3 minutes before cranking again. This allows the charger and battery to cool down.
4. If the engine fails to start, use the **BOOST** rate to charge for 5 minutes before attempting to crank the engine again.
5. After the engine starts, unplug the AC power cord before disconnecting the battery clamps from the vehicle.  
**NOTE:** If the engine does turn over but never starts, there is not a problem with the starting system; there is a problem somewhere else with the vehicle. **STOP** cranking the engine until the other problem has been diagnosed and corrected.

**WARNING:** Using the **ENGINE START** feature **WITHOUT** a battery installed in the vehicle will damage the vehicle's electrical system.

**During the starting sequence listed above, the charger is set to one of three states:**

1. **Wait for cranking** - While waiting for cranking, the digital display shows **RDY (READY)**. The charger waits until the engine is actually being cranked before delivering the amps for engine start.
2. **Cranking** - When cranking is detected, the charger will automatically deliver up to its maximum output as required by the starting system for up to 10 seconds.

- Cool Down** - After cranking, the charger enters a mandatory 180 seconds cool down state (Pressing any button does NOT work). The digital display indicates the remaining cool down time in seconds. It starts at 180 and counts down to 0. After 3 minutes, the digital display will change from displaying the countdown to displaying **RDY**.

**NOTE:** when waiting for cranking or after cooling down, if battery voltage is lower than 14.5V (for a 12V battery), charger will provide maximum 5A to charge the battery. When battery voltage reaches to 14.5V (whether STD or AGM or GEL battery type), the output current reduces to 0 and CHARGED/ MAINTAINING LED is lit.

## VOLTAGE TESTER AND CHARGER

When first turned on, the unit operates only as a tester, not as a charger. Selecting a charge rate activates the battery charger and deactivates the tester. To change the battery charger back to a tester, press the RATE SELECTION button until OFF is displayed, and press the DISPLAY button and let the VOLTAGE LED illuminate to show battery voltage.

**NOTE:** The battery tester is only designed to test batteries. Testing a device with a rapidly changing voltage could yield unexpected or inaccurate results.

## ALTERNATOR CHECK

- With the charger unplugged from the AC outlet, connect the charger to the battery, following the instructions given in previous sections.
- Start the vehicle and turn on the vehicle's headlights.
- Plug the charger AC power cord into the AC outlet.
- Read the voltage on the digital display. If you get a reading between 13.2 volts and 14.6 volts, the alternator is working properly. If the reading is less than 13.2 volts or more than 14.6 volts, have the charging system checked by a qualified technician.

# TROUBLESHOOTING

DISPLAY CONDITION	CAUSE	SOLUTION
<b>REVERSED</b> Display + REVERSE CONNECTION LED lit	Reverse Polarity	Change red and black clamps to the correct battery posts
<b>NO-CONNECT</b> Display	<ol style="list-style-type: none"> <li>1. Open-circuit</li> <li>2. Dirty Battery Posts</li> <li>3. Dead Battery (voltage below 1V)</li> <li>4. Output short circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect the red and black clamps to battery posts</li> <li>2. Clean the battery posts</li> <li>3. Replace the battery with a new one immediately</li> <li>4. Disconnect red and black output terminals</li> </ol>
<b>OVER-TEMP</b> Display	Overheat protection	<p>Current reduces when temperature in charger is too high. After cooling down for a few minutes, the charger will automatically begin charging with</p> <p>6&lt;&gt;2A CHARGE/MAINTAIN rate if a battery is connected, and the battery type has memory function and is the same as before.</p>
<b>BAD-BATT</b> Display	Battery cannot store electric charge during charging process.	Replace the battery with a new one immediately.

## **SMARTTECH LIMITED WARRANTY**

FOR ONE YEAR from the date of sale this product is warranted against defects in material or workmanship when it is operated and maintained according to all supplied instructions.

WITH PROOF OF SALE return a defective product to the retailer from which it was purchased for free replacement.

This warranty is void if this product is ever used while providing commercial services or if rented to another person.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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