



MODEL

**SC1306**

**Automatic Battery Charger**

**OWNERS MANUAL**



**PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE.**  
This manual will explain how to use the battery charger safely and effectively.  
Please read and follow these instructions and precautions carefully.

## 1. IMPORTANT SAFETY INSTRUCTIONS

### SAVE THESE INSTRUCTIONS.

- 1.1 **SAVE THESE INSTRUCTIONS –**  
This manual contains important safety and operating instructions.
- 1.2 Keep out of reach of children.
- 1.3 Do not expose the charger to rain or snow.
- 1.4 Use of an attachment not recommended or sold by Schumacher® Electric Corporation may result in a risk of fire, electric shock or injury to persons.
- 1.5 To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting charger.
- 1.6 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:
  - The pins on plug of extension cord are the same number, size and shape as those of plug on charger.
  - The extension cord is properly wired and in good electrical condition; and
  - The wire size is large enough for AC ampere rating of charger as specified in section 8.
- 1.7 Do not operate charger with damaged cord or plug – replace the cord or plug immediately.
- 1.8 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.
- 1.9 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.
- 1.10 To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- 1.11 **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 YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.
  - 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 markings on these products and on engine.

## 2. PERSONAL SAFETY PRECAUTIONS

- 2.1 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.
- 2.2 Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- 2.3 Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- 2.4 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- 2.5 NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- 2.6 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.
- 2.7 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.
- 2.8 Use charger for charging LEAD-ACID (STD, AGM, GEL or deep-cycle) rechargeable batteries with recommended rated capacities of 22-59Ah (12V). 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.
- 2.9 NEVER charge a frozen battery.
- 2.10 **WARNING:** This product contains one or more chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

### 3. PREPARING TO CHARGE

- 3.1 If necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
- 3.2 Be sure area around battery is well ventilated while battery is being charged.
- 3.3 Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- 3.4 Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve regulated lead acid batteries, carefully follow manufacturer's recharging instructions.
- 3.5 Study all battery manufacturer's specific precautions while charging and recommended rates of charge.
- 3.6 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.

### 4. CHARGER LOCATION

- 4.1 Locate charger as far away from battery as DC cables permit.
- 4.2 Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- 4.3 Never allow battery acid to drip on charger when reading electrolyte specific gravity or filling battery.
- 4.4 Do not operate charger in a closed-in area or restrict ventilation in any way.
- 4.5 Do not set a battery on top of charger.

### 5. DC CONNECTION PRECAUTIONS

- 5.1 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.
- 5.2 Attach clips to battery and chassis, as indicated in sections 6 and 7.

### 6. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

**WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:**

- 6.1 Position AC and DC cords to reduce risk of damage by hood, door, or moving engine part.
- 6.2 Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- 6.3 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- 6.4 Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (6.5). If positive post is grounded to the chassis, see (6.6).
- 6.5 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 gauge metal part of the frame or engine block.
- 6.6 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 gauge metal part of the frame or engine block.
- 6.7 When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
- 6.8 See *Operating Instructions* for length of charge information.

## 7. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE

**WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:**

- 7.1 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- 7.2 Attach at least a 24-inch-long 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- 7.3 Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- 7.4 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.
- 7.5 Do not face battery when making final connection.
- 7.6 When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- 7.7 A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

## 8. GROUNDING AND AC POWER CORD CONNECTIONS

8.1 This battery charger is for use on a nominal 120 volt circuit and has a grounded plug. The charger must be grounded, to reduce the risk of electric shock. 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.

8.2 **DANGER:** Never alter the AC cord or plug provided – if it does not fit the outlet, have a proper grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution.

**NOTE:** Pursuant to Canadian Regulations, use of an adapter plug is not allowed in Canada. Use of an adapter plug in the United States is not recommended and should not be used.

### 8.3 USING AN EXTENSION CORD

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

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

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

\*AWG-American Wire Gauge

## 9. ASSEMBLY INSTRUCTIONS

9.1 Remove all cord wraps and uncoil the cables prior to using the battery charger.

## 10. CONTROL PANEL

### START/STOP BUTTON

Press to immediately begin charging your properly connected battery. **If the button is not pressed, charging should begin in ten minutes.**

### LED INDICATORS


#### POWER (green) LED:

The charger is connected to an AC outlet.


#### % LEDs

Act as a gauge to indicate the following:

- **Charging** – The three leftmost LEDs light, indicating the percentage of the battery's charge.


- **Maintaining** – The rightmost LED will light, indicating the battery is fully charged and is being maintained.
- **Boost** – The three leftmost LEDs light, indicating the percentage of the battery's charge. Boost is not intended to fully charge the battery.
- **Engine Start** – The four LEDs light in sequence, indicating the unit is ready for Engine Start.
- **Engine Start cool-down** – The four LEDs turn off, and the  LED will blink.


 **CLAMPS REVERSED (red) LED flashing:** The connections are reversed.


 **BAD BATTERY (red) LED lit:**  
The charger has detected a problem with the battery. See *Troubleshooting* for more information.


**NOTE:** See *Operating Instructions* for a complete description of the charger modes.


 **RATE SELECTION BUTTON**  
Use this button to select one of the following:


 **6<->2A CHARGE/MAINTAIN –**  
For charging small and large batteries. Not recommended for industrial applications. The charger will automatically adjust the charging current, based on battery size, in order to charge the battery completely, efficiently and safely.


 **20A BOOST –**  
For quickly adding energy to a severely discharged or large capacity battery prior to ENGINE START. The unit will automatically switch to 6A<->2A CHARGE after the 20A BOOST operation has completed.

 **80A ENGINE START –**  
Provides additional amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery.

 **BATTERY TYPE BUTTON**  
Use this button to select the battery type.

 **STD** – Used in cars, trucks and motorcycles, these batteries have vent caps and are often marked “low maintenance” or “maintenance-free”. This type of battery is designed to deliver quick bursts of energy (such as starting engines) and has a greater plate count. The plates are thinner and have somewhat different material composition. Regular batteries should not be used for deep-cycle applications.

 **AGM** – The Absorbed Glass Mat construction allows the electrolyte to be suspended in close proximity with the plate’s active material. In theory, this enhances both the discharge and recharge efficiency. The AGM batteries are a variant of Sealed VRLA (valve regulated lead-acid) batteries. Popular uses include high-performance engine starting, power sports, deep-cycle, solar and storage batteries.

 **GEL** – The electrolyte in a GEL cell has a silica additive that causes it to set up or stiffen. The recharge voltages on this type of cell are lower than those for other styles of lead-acid battery. This is probably the most sensitive cell in terms of adverse reactions to overvoltage charging. Gel batteries are best used in VERY DEEP cycle application and may last a bit longer in hot weather applications. If the wrong battery charger is used on a gel cell battery, poor performance and premature failure will result.

## 11. OPERATING INSTRUCTIONS

**WARNING:** A spark near the battery may cause an explosion.

### CHARGING A BATTERY IN THE VEHICLE

1. Turn off all the vehicle’s accessories.
2. Keep the hood open.
3. Clean the battery terminals.
4. Place the charger on a dry, non-flammable surface.
5. Lay the AC/DC cables away from any fan blades, belts, pulleys and other moving parts.
6. Connect the battery, following the precautions listed in sections 6 and 7.
7. Connect the charger to a live grounded 120V AC outlet.
8. Select the battery type and charge rate.
9. Press the Start/Stop button to begin charging immediately. If the button is not pressed, charging will begin within ten minutes. It will finish automatically.
10. When charging is complete, disconnect the charger from the AC

power, remove the clamps from the vehicle’s chassis, and then remove the clamp from the battery terminal.

### CHARGING A BATTERY OUTSIDE OF THE VEHICLE

1. Place battery in a well-ventilated area.
2. Clean the battery terminals.
3. Connect the battery, following the precautions listed in sections 6 and 7.
4. Connect the charger to a live grounded 120V AC outlet.
5. Select the battery type and charge rate.
6. Press the Start/Stop button to begin charging immediately. If the button is not pressed, charging will begin within ten minutes. It will finish automatically.
7. When charging is complete, disconnect the charger from the AC power, disconnect the negative clamp, and finally the positive clamp.
8. A marine (boat) battery must be removed and charged on shore.

**NOTE:** This charger is equipped with an auto-start feature. Current will not be supplied to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.

### AUTOMATIC CHARGING


When an Automatic Charge is performed, the charger switches to the maintain mode automatically after the battery is charged.

### BATTERY CHARGING TIMES




APPLICATION	BATTERY SIZE	CHARGING TIME (Hours)			
		6A	10A	20A	30A
POWERSPORTS ↓	6Ah	2	1.5	.5	.5
	32Ah ▲	5	4	1.5	1
AUTOMOTIVE ↓	300 CCA	4	3	1.5	1.5
	1000 CCA ▲	10	7	3.5	3
MARINE ↓	50Ah	5	3.5	1.5	1
	105Ah ▲	11	8	4	3

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


### ABORTED CHARGE

If charging cannot be completed normally, charging will abort. When charging aborts, the charger's output is shut off and the Bad Battery  (red) LED will light. Do not continue attempting to charge this battery. Have it checked or replaced.


### DESULFATION MODE

While desulfation is in progress, the  % and Bad Battery  LEDs will be lit. Desulfation could take 8 to 10 hours. If desulfation fails, charging will abort and the Bad Battery  (red) LED will remain lit.

### COMPLETION OF CHARGE

Charge completion is indicated by the rightmost  % LED (representing a 100% charged battery). When lit, the charger has switched to the maintain mode of operation.

### MAINTAIN MODE (FLOAT MODE MONITORING)

When the rightmost  % LED is lit, the charger has started maintain mode. In this mode, the charger keeps the battery fully charged by delivering a small current when necessary. If the charger has to provide its maximum maintain current for a continuous 12 hour period, it will go into abort mode (see *Aborted Charge* section). This is usually caused by a drain on the battery or the battery could be bad.

### MAINTAINING A BATTERY

The SC1306 charges and maintains 12-volt batteries, keeping them at full charge.




**NOTE:** The maintain mode technology allows you to safely charge and maintain a healthy battery for extended periods of time. However, problems with the battery, electrical problems in the vehicle, improper connections or other unanticipated conditions could cause excessive current draws. As such, occasionally monitoring your battery and the charging process is required.

### USING THE ENGINE START FEATURE

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.

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

**NOTE:** If you have charged the battery and it still will not start your car, do not use the Engine Start feature, or it could damage the vehicle's electrical system. Have the battery checked.

1. With the charger unplugged from the AC outlet, connect the charger to the battery following the instructions given in *Charging a Battery in the Vehicle*.
2. Connect the charger to a live grounded 120V AC outlet.
3. With the charger plugged in and connected to the battery and chassis, press the  Rate Selection button until the  Engine Start LED is lit.
4. Press the START/STOP button to begin Engine Start. Engine Start will not begin without pressing the START/STOP button.
5. Wait 2 minutes before cranking the engine.
6. 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. The  Engine Start LED will blink during the 3 minute cool-down.

**NOTE:** During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.





7. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
8. After the engine starts, unplug the AC power cord before disconnecting the battery clamps from the vehicle.
9. Clean and store the charger in a dry location.

**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.

## ENGINE STARTING NOTES

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

- **Wait for cranking** – The charger waits until the engine is actually being cranked before delivering the amps for Engine Start.
- **Cranking** – When cranking is detected, the charger will automatically deliver up to its maximum output as required by the starting system for up to 3 seconds or until the engine cranking stops.
- **Cool Down** – After cranking, the charger enters a mandatory 3 minute (180 second) cool down state. This is indicated by the blinking  Engine Start LED. After three minutes, the  % LEDs will light in sequence and the Engine Start LED will be lit.




## 12. MAINTENANCE AND CARE



A minimal amount of care can keep your battery charger working properly for years.

- Clean the clamps each time you are finished charging. Wipe off any battery fluid that may have come in contact with the clamps to prevent corrosion.
- Occasionally cleaning the case of the charger with a soft cloth will keep the finish shiny and help prevent corrosion.

- Coil the input and output cords neatly when storing the charger. This will help prevent accidental damage to the cords and charger.
- Store the charger unplugged from the AC power outlet in an upright position.
- Store inside, in a cool, dry place. Do not store the clamps clipped together, clipped to the handle, on or around metal, or clipped to the cables.

## 13. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery clamps do not spark when touched together.	The START/STOP button has not been pressed.	Press the START/STOP button.
The charger will not turn on when properly connected.	AC outlet is dead.  Poor electrical connection.  Battery is defective.	Check for open fuse or circuit breaker supplying AC outlet.  Check power cord and extension cord for loose fitting plug.  Have battery checked.
The battery is properly connected, but the  % LEDs never lit.	The battery voltage is low.	Press the START/STOP button to start charging.
The  and  % LEDs are lit.	The battery is sulfated.	The charger is in desulfation mode. Continue charging for several hours. If not successful, have the battery checked.

PROBLEM	POSSIBLE CAUSE	SOLUTION
The  Bad Battery LED is lit.	<p>The battery voltage is still below 10V after 2 hours of charging. (or) In maintain mode, the output current is more than 1.5A for 12 hours.</p> <p>Desulfation was unsuccessful.</p> <p>The battery voltage drops to below 12.2V in Maintain Mode.</p>	<p>The battery may be defective. Make sure there are no loads on the battery. If there are, remove them. If there are none, have the battery checked or replaced.</p> <p>The battery may be defective. Have battery checked or replaced.</p> <p>The battery won't hold a charge. May be caused by a drain on the battery or the battery could be bad. Make sure there are no loads on the battery. If there are remove them. If there are none, have the battery checked or replaced.</p>
Short or no start cycle when cranking engine.	<p>Drawing more than the Engine Start Rate.</p> <p>Failure to wait 3 minutes (180 seconds) between cranks.</p> <p>Clamps are not making a good connection.</p> <p>AC cord and/or extension cord is loose.</p> <p>No power at receptacle.</p> <p>The charger may be overheated.</p> <p>Battery may be severely discharged.</p>	<p>Crank time varies with the amount of current drawn. If cranking draws more than the Engine Start Rate, crank time may be less than 3 seconds.</p> <p>Wait 3 minutes of rest time before the next crank, to allow the battery and charger to cool down.</p> <p>Check for poor connection at battery and frame.</p> <p>Check power cord and extension cord for loose fitting plug.</p> <p>Check for open fuse or circuit breaker supplying AC outlet.</p> <p>The thermal protector may have tripped and needs a little longer to close. Make sure the charger vents are not blocked. Wait and try again.</p> <p>On a severely discharged battery, use the  20A Boost setting for few minutes, to help assist in cranking.</p>

## 14. SPECIFICATIONS

Input..... 120V AC @ 60Hz, 6A continuous/19.5A intermittent  
Output..... 12V DC, 2<->6A (180 sec. on @ 2A, 120 sec. on @ 6A)  
20<->10A (60 sec. on @ 20A, 90 sec. on @ 10A)  
90A intermittent (5 seconds maximum on, 180 seconds minimum off)