



Model:

**SP-200**

**Solar Battery Maintainer**



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

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## 1. IMPORTANT SAFETY INSTRUCTIONS

### SAVE THESE INSTRUCTIONS.

#### 1.1 SAVE THESE INSTRUCTIONS –

This manual contains important safety and operating instructions.

#### RISK OF ELECTRIC SHOCK OR FIRE.

- 1.2 Keep out of reach of children.
- 1.3 Use only recommended attachments. 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 or damage to property.
- 1.4 To reduce the risk of electric shock, unplug the clips from the solar battery maintainer before attempting any maintenance or cleaning.
- 1.5 Do not operate the solar battery maintainer if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service person.
- 1.6 Do not disassemble the solar battery maintainer; take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of fire or electric shock.

#### RISK OF EXPLOSIVE GASES.

- 1.7 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 THAT YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE SOLAR BATTERY MAINTAINER.
- 1.8 To reduce the risk of a battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review the cautionary markings on these products and on the engine.
- 1.9 Locate this solar battery maintainer 18 inches (45.72 cm) or more above floor level. Do not place on wet ground, anywhere it could be accidentally stepped on or in a place or position where it could fall while being used.
- 1.10 Pursuant to California Proposition 65, this product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

## 2. PERSONAL PRECAUTIONS

#### RISK OF EXPLOSIVE GASES.

- 2.1 NEVER smoke or allow a spark or flame in the vicinity of a battery or engine.
- 2.2 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.
- 2.3 Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical part that may cause an explosion.
- 2.4 Use this solar battery maintainer for maintaining LEAD-ACID batteries only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use this solar battery maintainer for maintaining dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- 2.5 NEVER maintain a frozen battery.
- 2.6 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.
- 2.7 Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing or eyes.
- 2.8 Wear complete eye and body protection, including safety goggles and protective clothing. Avoid touching your eyes while working near the battery.
- 2.9 If battery acid contacts your skin or clothing, immediately wash the area with soap and water. If acid enters your eye, immediately flood the eye with cold running water for at least 10 minutes and get medical attention right away.
- 2.10 If battery acid is accidentally swallowed, drink milk, the whites of eggs or water. DO NOT induce vomiting. Seek medical attention immediately.

### 3. PREPARING TO MAINTAIN

#### **RISK OF CONTACT WITH BATTERY ACID. BATTERY ACID IS A HIGHLY CORROSIVE SULFURIC ACID.**

- 3.1 If it is necessary to remove the battery from the vehicle to maintain it, always remove the grounded terminal first. Make sure all of the accessories in the vehicle are off to prevent arcing.
- 3.2 Be sure the area around the battery is well ventilated while the battery is being maintained.
- 3.3 Clean the battery terminals before maintaining the battery. During cleaning, keep airborne corrosion from coming into contact with your eyes, nose and mouth. Use baking soda and water to neutralize the battery acid and help eliminate airborne corrosion. Do not touch your eyes, nose or mouth.
- 3.4 Add distilled water to each cell until the battery acid reaches the level specified by the battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve regulated lead acid batteries (VRLA), carefully follow the manufacturer's recharging instructions.
- 3.5 Read, understand and follow all instructions for the solar battery maintainer, battery, vehicle and any equipment used near the battery and solar battery maintainer. Study all of the battery manufacturer's specific precautions while in use.
- 3.6 Determine the voltage of the battery by referring to the vehicle owner's manual and make sure that the output voltage of the solar battery maintainer is the correct voltage.
- 3.7 Make sure that the solar battery maintainer cable clips make tight connections.

### 4. SOLAR BATTERY MAINTAINER LOCATION

#### **RISK OF EXPLOSION AND CONTACT WITH BATTERY ACID.**

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

### 5. DC CONNECTION PRECAUTIONS

- 5.1 Never allow the clips to touch each other.
- 5.2 Attach the clips to the battery and chassis, as indicated in sections 6 and 7.

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

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

- 6.1 Position the DC cables to reduce the risk of damage by the hood, door and moving or hot engine parts. **NOTE:** If it is necessary to close the hood during the maintaining process, ensure that the hood does not touch the metal part of the battery clips or cut the insulation of the cables.
- 6.2 Stay clear of fan blades, belts, pulleys and other parts that can cause injury.
- 6.3 Check the polarity of the battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.
- 6.4 Determine which post of the battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see step 6.5. If the positive post is grounded to the chassis, see step 6.6.
- 6.5 For a negative-grounded vehicle, connect the POSITIVE (RED) clip from the solar battery maintainer to the POSITIVE (POS, P, +) ungrounded post of the battery. Connect the NEGATIVE (BLACK) clip to the vehicle chassis or engine block away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.

**6.6** For a positive-grounded vehicle, connect the **NEGATIVE (BLACK)** clip from the solar battery maintainer to the **NEGATIVE (NEG, N, -)** ungrounded post of the battery. Connect the **POSITIVE (RED)** clip to the vehicle chassis or engine block away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal

part of the frame or engine block.

- 6.7** Using the quick-connect connector, plug the clips into the solar battery maintainer.
- 6.8** When disconnecting the solar battery maintainer, unplug the clips from the solar battery maintainer, remove the clip from the vehicle chassis, then remove the clip from the battery terminal.

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

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

- 7.1** Check the polarity of the battery posts. The **POSITIVE (POS, P, +)** battery post usually has a larger diameter than the **NEGATIVE (NEG, N, -)** post.
- 7.2** Attach at least a 24-inch (61 cm) long 6-gauge (AWG) (13 mm<sup>2</sup>) insulated battery cable to the **NEGATIVE (NEG, N, -)** battery post.
- 7.3** Connect the **POSITIVE (RED)** solar battery maintainer clip to the **POSITIVE (POS, P, +)** post of the battery.
- 7.4** Position yourself and the free end of the cable you previously attached to the **NEGATIVE (NEG, N, -)** battery post as far

away from the battery as possible – then connect the **NEGATIVE (BLACK)** solar battery maintainer clip to the free end of the cable.

- 7.5** Do not face the battery when making the final connection.
- 7.6** Using the quick-connect connector, plug the clips into the solar battery maintainer.
- 7.7** When disconnecting the solar battery maintainer, always do so in the reverse order of the connecting procedure and break the first connection while as far away from the battery as practical.
- 7.8** A marine (boat) battery must be removed and maintained on shore. To maintain it onboard requires equipment specially designed for marine use.

## 8. ASSEMBLY AND MOUNTING INSTRUCTIONS

- 8.1** Remove all cord wraps and uncoil the cables prior to using the solar battery maintainer.  
To mount the solar battery maintainer (in a dry location off the ground):
  - 1.** Using the solar battery maintainer as a template (guide), mark the location of the four pre-molded mounting holes on a secure, flat surface.

- 2.** If necessary, drill four 7/64" (0.109) dia. pilot holes.
- 3.** Mount the solar battery maintainer using the four stainless steel screws provided.

**NOTE:** Do not overtighten the screws or you will break the plastic frame of the solar battery maintainer.

## 9. FEATURES



- 1.** Solar panel
- 2.** Quick-connect 50 Amp battery clip cable assembly
- 3.** Quick-connect 12V accessory plug cable assembly

## 10. OPERATING INSTRUCTIONS

**WARNING:** This solar battery maintainer must be properly assembled in accordance with the assembly instructions before it is used.

The solar battery maintainer does not have an ON/OFF switch. The On and Off commands are controlled by placing the solar battery maintainer in the sun only after the battery connections have been made.

You MUST disconnect the solar battery maintainer from the 12 volt power outlet or battery when starting the engine or driving the vehicle. Electrical surges from the alternator when starting and running may damage the solar battery maintainer.

**NOTE:** The clips and 12V output are always live.

### MAINTAINING A BATTERY

1. Ensure that all of the solar battery maintainer components are in place and in good working condition, for example, the plastic boots on the battery clips.
2. Decide whether you are going to use the 12 volt accessory plug or the 50 Amp battery clips to connect the solar battery maintainer to the vehicle. Connect the proper cable to the solar battery maintainer making sure the connection is secure.
  - If using the 12 volt accessory plug, plug the connector into the vehicle's power outlet making sure the connection is secure.
  - If using the 50 Amp battery clips, connect the battery following the precautions listed in sections 6 and 7.
3. Place the solar battery maintainer in the sun. For optimum solar panel output, face the front (glass) side of the solar panel towards the sun, making sure there are no shadows being cast on the panel by the vehicle or other objects. The best orientation to place the solar panel is in a south-to-north direction with the panel tilted at a suitable angle. The best angle would be the same as your local latitude.
4. To disconnect, reverse the procedure. If you are maintaining a fully charged battery, you are properly utilizing the solar battery maintainer. The SP-200 maintains 12 volt batteries, keeping them at full charge. However, if you use

this solar battery maintainer to *charge* a battery, you may lose some of the battery's capacity. This would cause the battery to be unable to hold a charge and become useless. Therefore, we do not recommend charging any battery with this unit

**NOTE:** The maintain mode technology allows you to safely 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 maintaining process is recommended.

### USING THE QUICK-CONNECT CABLE ASSEMBLIES

Connect either of the two output cable assemblies to the solar battery maintainer. Do not place on wet ground, anywhere it could be accidentally stepped on or in a place or position where it could fall while being used. Never use the output cables together or for other applications.

#### 50 AMP BATTERY CLIP CABLE ASSEMBLY

1. Connect the end of the solar battery maintainer output cable to the end of the 50 amp battery clips cable.
2. Follow the steps in sections 6 and 7 to connect the output clips to the battery.
3. After a good electrical connection is made to the battery, place the solar battery maintainer in the sun, per the instructions in step 4 of the *Solar Battery Maintainer Location* section.

#### 12V ACCESSORY PLUG CABLE ASSEMBLY

Maintain or charge your battery without lifting the hood.

1. Connect the end of the 12V accessory plug cable to the solar battery maintainer.
2. Insert the 12V accessory plug into the 12V accessory outlet.
3. Route the power cord from the solar battery maintainer through the vehicle's open window.
4. Place the solar battery maintainer in the sun, per the instructions in step 4 of the *Solar Battery Maintainer Location* section.

## 11. MAINTENANCE INSTRUCTIONS

- 11.1 After use and before performing maintenance, unplug and disconnect the solar battery maintainer (see sections 6, 7 and 8).
- 11.2 Use a dry cloth to wipe all battery corrosion and other dirt or oil from the battery clips, cords and the solar panel.
- 11.3 The solar battery maintainer uses a glass substrate; handle with care.
- 11.4 Always keep the glass surface clean using a soft cloth in order to ensure its maximum output.
- 11.5 Ensure that all of the solar battery maintainer components are in place and in good working condition, for example, the plastic boots on the battery clips.
- 11.6 Servicing does not require opening the unit, as there are no user-serviceable parts.
- 11.7 All other servicing should be performed by qualified service personnel.

## 12. MOVING AND STORAGE INSTRUCTIONS

- 12.1 Store the solar battery maintainer unplugged, in an upright position.
- 12.2 Store inside, in a cool, dry place.
- 12.3 Do not store the clips clipped together, on or around metal, or clipped to cables.
- 12.4 If the solar battery maintainer is moved around the shop or transported to another location, take care to avoid/prevent damage to the cords, clips and solar battery maintainer. Failure to do so could result in personal injury or property damage.

## 13. SPECIFICATIONS

Peak power output.....	2.4 Watt
Tested under standard conditions.....	AM1.5, 100mW/cm <sup>2</sup> , 25°C
Optimum working voltage.....	17.50 V
Optimum working current.....	130 mAh
Operating temperature.....	-40° F–185° F (-40° C–85° C)