# 100A Flash Reprogrammer / Power Supply with Battery Support

**OWNERS MANUAL**

UL LISTED 78-1

**PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE.**

This manual will explain how to use the unit safely and effectively. Please read and follow these instructions and precautions carefully.

## 1. IMPORTANT SAFETY INSTRUCTIONS – SAVE THESE INSTRUCTIONS

**SAVE THESE INSTRUCTIONS –** This manual contains important safety and operating instructions.

**WARNING: RISK OF ELECTRIC SHOCK OR FIRE.**

**1.1** Keep out of reach of children.

**1.2** Do not expose the unit to rain or snow.

**1.3** Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock or injury to persons.

**1.4** To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting the unit.

**1.5** 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 the unit.
- The extension cord is properly wired and in good electrical condition.
- The wire size is large enough for AC ampere rating of the unit, as specified in section 8.

**1.6** Do not operate the unit with a damaged cord or plug – replace the cord or plug immediately.

**1.7** Do not operate the unit if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceperson.

**1.8** Do not disassemble the unit; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

**1.9** To reduce risk of electric shock, unplug the unit from the outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

**1.10 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 UNIT.

**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 unit for only LEAD-ACID rechargeable batteries. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application.

**2.9** NEVER use with a frozen battery.

## 3. PREPARING TO USE THE UNIT WITH A BATTERY

**3.1** If necessary to remove the battery from the vehicle, always remove the 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 using the unit.

**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 using the unit with a battery.

**3.6** Determine the voltage of the battery by referring to the car owner's manual and make sure that the battery is a 12V rated battery. The unit is designed for 12V batteries only.

**3.7** Make sure that the unit's cable clips make tight connections.

## 4. UNIT LOCATION

**4.1** Locate the unit as far away from battery as DC cables permit.

**4.2** Never place the unit directly above the battery; gases from battery will corrode and damage the unit.

**4.3** Never allow battery acid to drip on the unit when reading electrolyte specific gravity or filling battery.

**4.4** Do not operate the unit in a closed-in area or restrict ventilation in any way.

**4.5** Do not set a battery on top of the unit.

***For the manual with Spanish and French, plus warranty cards, visit www.batterychargers.com or call 1-800-621-5485.***

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***Pour le manuel avec espagnol et français ainsi que les cartes de garantie, visitez le site www.batterychargers.com ou appelez le 1-800-621-5485.***

## 5. DC CONNECTION PRECAUTIONS

**5.1** Connect and disconnect DC output clips only after setting any switches to "off" position and removing AC cord from electric outlet. Never allow the clips of the unit 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 the unit 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 the unit 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** Connect the unit's AC supply cord to electrical outlet and press the START/STOP button to turn the output on.

**6.8** When disconnecting the unit, press the START/STOP button to turn the output off, disconnect the AC cord, remove the clip from the vehicle chassis and then remove the clip from the battery terminal.

## 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 4-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, –) battery post.

**7.3** Connect POSITIVE (RED) 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) clip to free end of cable.

**7.5** Do not face battery when making final connection.

**7.6** Connect the unit's AC supply cord to electrical outlet and press the START/STOP button to turn the output on.

**7.7** When disconnecting the unit, press the START/STOP button to turn the output off, disconnect the AC cord, remove the clip from the cable attached to the negative battery terminal and then remove the clip from the positive battery terminal.

## 8. GROUNDING AND AC POWER CORD CONNECTIONS

**8.1** This unit is for use on a nominal 120 volt circuit and has a grounded plug. The unit 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 the unit.
- 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 unit as specified:
  - 100 feet (30.5 meters) long or less – use a 12 gauge (3.31 $mm^2$) extension cord.
  - Over 100 feet (30.5 meters) long – use an 8 gauge (8.36 $mm^2$) extension cord.

## 9. ASSEMBLY INSTRUCTIONS

**9.1** Remove all cord wraps and uncoil the cables prior to using the unit.

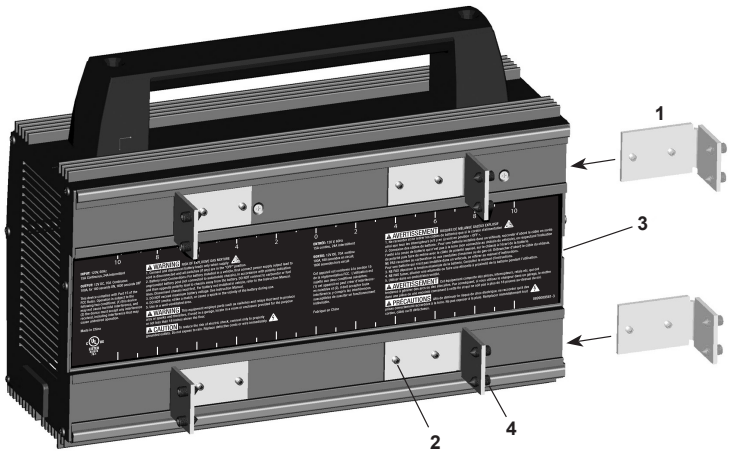
## 10. MOUNTING INSTRUCTIONS

To permanently mount the unit, use the following instructions:

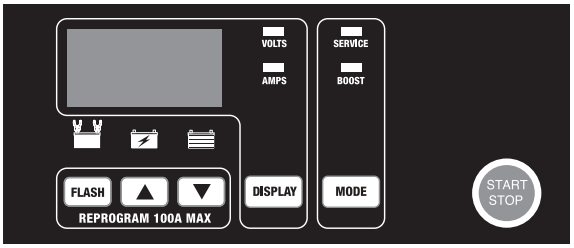
**10.1** Slide all 4 brackets (Item 1) into the track on the back, from the right side, as shown above. Make sure the set screws (Item 2) are unscrewed enough so they do not scratch the surface of the housing.

**10.2** Measure what you are mounting the unit to before deciding where to locate the brackets (add an additional ¼ to ½ inch). Use the ruler on the label (Item 3) to mount the brackets (Item 1) in the correct position (position each bracket an equal distance from the center of the unit). Note that the inches shown are for both bracket dimensions combined (meaning the dimensions are doubled), this is for easier reference. Make sure the ¼-28 set screws (Item 4) are unscrewed enough so the pointed end is almost flush with the bracket. Mount the brackets (Item 1) by tightening all 8 set screws (Item 2) to 14 in/lb (1.6 n/m) of torque.

**10.3** Lift the unit by its handle and set it against your mounting location, tighten the set screws (Item 4) to 66 in/lb (7.5 n/m) of torque to secure the brackets (Item 1), starting with the top two brackets first.



## 11. CONTROL PANEL




**CONNECTED LED (yellow/orange) –** Lights when the battery is properly connected.

**CHARGING LED (yellow/orange) –** Lights when output begins; turns off when maximum voltage is reached.

**CHARGED LED (green) –** Lights when maximum voltage is reached.

**FLASH REPROGRAM button –** Press to select the Flash Reprogram function. See *Operating Instructions* for details of this function.

**▲ and ▼ (UP and DOWN) buttons** – Use these buttons to set the voltage needed for Flash Reprogram.

**Digital Display –** Gives a digital indication of voltage or amperes, depending on the display function chosen.

**DISPLAY Button –** Press to set the function of the digital display to one of the following:

- **VOLTS (Voltmeter) –** The voltmeter indicates the voltage at the load/battery terminals. If the reading is 12.8 volts or more when output is off, the battery is charged.
- **AMPS (Ammeter) –** The ammeter indicates the amount of current, measured in amps, that is being drawn by the load/battery (± 2 amps).

**MODE Button –** Use this button to select between Service and Boost modes. See *Operating Instructions* for details of these modes.

**START/STOP Button –** This starts and stops all modes.

## 12. OPERATING INSTRUCTIONS

### APPLICATION INFORMATION

This unit can be used to support 12V batteries with rated capacities of 12 Ah to 111 Ah.

### UNIT OPERATION

NOTE: Once Service, Boost or Flash Reprogram has started, the buttons will not work until you turn off the output, with the exception of the START/STOP button. When the display shows OFF, no buttons will work for five seconds as the unit automatically goes back to the default settings.

### SERVICE MODE

Use to prevent the battery from being discharged during service and in the showroom.

1. Connect the battery and AC power, following the precautions listed in sections 5, 6 and 7.
2. Set the Mode to Service.
3. The Volts LED will light, and the display will show battery voltage.
4. Press the START/STOP button. The yellow/orange Charging LED will light.
5. The green Charged LED will light and the yellow/orange Charging LED will turn off when the maximum voltage is reached. NOTE: Maximum voltage for Service Mode is 13.5V.

### BOOST MODE

For quickly adding energy to a severely discharged or large capacity battery.

NOTE: Do not leave in Boost mode for extended periods of time. When connected for long periods of time, Service Mode is recommended.

1. Connect the battery and AC power, following the precautions listed in sections 5, 6 and 7.
2. Set the Mode to Boost.
3. The Volts LED will light, and the display will show battery voltage.
4. Press the START/STOP button. The yellow/orange Charging LED will light.
5. The green Charged LED will light and the yellow/orange Charging LED will turn off when the maximum voltage is reached.
   NOTE: Maximum voltage for Boost Mode is 14.4V. Disconnect the unit when maximum voltage has been reached, to avoid overheating of the battery.

### 100A FLASH REPROGRAM

NOTE: Do not attempt to Flash Reprogram a vehicle that has a discharged or defective battery. Make sure that the vehicle battery is in good condition and fully charged before proceeding. In Flash Reprogram Mode, the unit is able to deliver 70A charging current continuously, and to deliver up to 100A for three minutes.

1. Press the Flash button.
2. The Volts LED will light, and the display will show the default setting 14.2V.
3. Press the ▲ and ▼ buttons to adjust to the voltage needed for the vehicle being programmed (refer to OEM specifications). Selected voltage is shown on the digital display. The unit has a voltage range of 13 to 14.8, with a default of 14.2.
4. Press the START/STOP button.
5. When finished, press the START/STOP button to exit this mode.

### USING THE BATTERY VOLTAGE TESTER

#### Overview

This unit has a built-in voltmeter to measure your battery's voltage. The unit does not have a built in load tester. As such, a recently charged battery could have a temporarily high voltage due to what is known as "surface charge". The voltage of such a battery will gradually drop during the period immediately after the charging system is disengaged. Consequently, the tester could display inconsistent values for such a battery. For a more accurate reading, the surface charge should be removed by temporarily creating a load on the battery, such as by turning on lights or other accessories for a couple of minutes before you read the display. Read it a couple of minutes after you have shut the lights off.

#### Testing Sequence

There are seven basic steps required to test the battery state of charge:

NOTE: You cannot test the battery voltage while Flash Reprogram, Boost or Service modes are active.

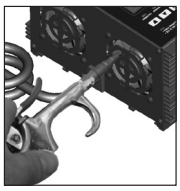
1. With the unit unplugged from the AC outlet, connect the unit to the battery, following the instructions given in Sections 6 and 7.
2. Plug the unit's AC power cord into the AC outlet.
3. The yellow/orange Connected LED will light if a properly connected battery is detected.
4. Confirm the yellow/orange Charging LED is off.
5. Set the Display to Volts.
6. If the output is on, press the START/STOP button. If the output is already off, do not press the START/STOP button.
7. Read the voltage on the digital display.

#### General Usage Notes

**Fans –** The unit is designed to control its cooling fans for efficient operation. It is normal for the fans to start and stop as needed. Keep the area near the unit clear of obstructions to allow the fans to operate efficiently. NOTE: The unit has thermal protection, and it will shut down if it gets too hot.

**Voltage –** The voltage displayed during output is the loading voltage and is usually higher than the battery's resting voltage.

## 13. MAINTENANCE INSTRUCTIONS



- Before performing maintenance, unplug and disconnect the unit.
- After use, unplug the unit and use a dry cloth to wipe all battery corrosion and other dirt or oil from the terminals, cords, and the case.
- After every 100 hours or whenever you see dust accumulating on the fan blades, you should clean both fans using compressed air (as shown). NOTE: Use the compressed air on the fan blades only. Do not blow dirt into the fan shaft or bearing. These fans push a lot of air and are precision balanced. Excessive dirt and grime buildup will cause the fan to be unbalanced and wear out quickly. If the fans fail, the unit may overheat and the thermal protection of the unit will shut it down.
- Ensure that all of the components are in place and in good working condition, including the plastic boots on the battery clips.
- Servicing does not require opening the unit, as there are no user-serviceable parts.

## 14. MOVING AND STORAGE INSTRUCTIONS

- If the unit is moved around the shop or transported to another location, take care to avoid/prevent damage to the cords, clips and unit. Failure to do so could result in personal injury or property damage. Do not store the clips on the handle, clipped together, on or around metal, or clipped to cables.
- Store the unit unplugged. The cord will still conduct electricity until it is unplugged from the outlet.
- Store inside, in a dry, cool place.

## 15. TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| No display and the LEDs are not lit. | Unit is not plugged in.<br><br>No power at the receptacle. | Plug the unit into an AC outlet.<br><br>Check for open fuse or circuit breaker supplying AC outlet. |
| Display reads 0.0 volts. | Clamps are not making a good connection to the battery.<br><br>Connections are reversed.<br><br>Battery is defective. | Check for poor connection to battery and frame. Make sure connection points are clean. Rock clamps back and forth for a better connection.<br><br>Unplug the unit and reverse the clips.<br><br>Have battery checked. |
| The battery is connected and the unit is on, but there is no output. | Battery is severely discharged (Service/Boost modes only). | If your battery does not have 1 volt, you must press and hold the START/STOP button for five seconds. |
| Unit has shut down or will not turn on when properly connected. | The unit has gotten too hot and it has shut down. | The unit has thermal protection, and it will shut down if it gets too hot. Unplug the AC cord and let the unit cool down. Make sure there is nothing obstructing the air flow to the fans. Clean them as shown in *Maintenance Instructions*. |
| The cooling fan is making a rattling noise. | The fan has a buildup of dirt and grime, causing it to be unbalanced. | Blow the dirt and grime off the fan blades using compressed air, as described in *Maintenance Instructions*. |

## 16. REPLACEMENT PARTS

Battery cable, 3m (4 AWG) ..... 2299003103Z
Battery cable, 4m (2 AWG) ..... 2299003115Z
Battery cable, 5m (2 AWG) ..... 2299003116Z

## 17. BEFORE RETURNING FOR REPAIRS

**For information about troubleshooting, contact customer service for assistance:**
**services@schumacherelectric.com | www.batterychargers.com | or call 1-800-621-5485**

For **REPAIR OR RETURN,** contact Customer Service at 1-800-621-5485. **DO NOT SHIP UNIT** until you receive a **RETURN MERCHANDISE AUTHORIZATION (RMA)** number from Customer Service at Schumacher Electric Corporation.

## 18. LIMITED WARRANTY

***Go to www.batterychargers.com to register your product online.***

**SCHUMACHER ELECTRIC CORPORATION, 801 BUSINESS CENTER DRIVE, MOUNT PROSPECT, IL 60056-2179, MAKES THIS LIMITED WARRANTY TO THE ORIGINAL RETAIL PURCHASER OF THIS PRODUCT. THIS LIMITED WARRANTY IS NOT TRANSFERABLE OR ASSIGNABLE.**

Schumacher Electric Corporation (the "Manufacturer") warrants this unit for one (1) year from the date of purchase at retail against defective material or workmanship that may occur under normal use and care. If your unit is not free from defective material or workmanship, Manufacturer's obligation under this warranty is solely to repair or replace your product with a new or reconditioned unit at the option of the Manufacturer. It is the obligation of the purchaser to forward the unit, along with proof of purchase and mailing charges prepaid to the Manufacturer or its authorized representatives in order for repair or replacement to occur.

Manufacturer does not provide any warranty for any accessories used with this product that are not manufactured by Schumacher Electric Corporation and approved for use with this product. This Limited Warranty is void if the product is misused, subjected to careless handling, repaired, or modified by anyone other than Manufacturer or if this unit is resold through an unauthorized retailer.

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