

Automatic Battery Charger/Maintainer

OWNERS MANUAL



PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE.

This manual will explain how to use the 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 the battery charger manufacturer 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.
 - 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 serviceperson.
- 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 the 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 the charger for charging only 12V lead-acid or lithium ion LiFePO₄ rechargeable batteries. 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.

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. 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.

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 below:

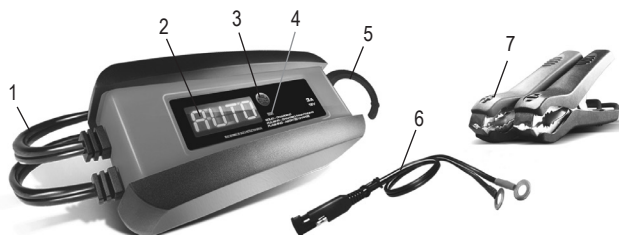
Length of cord (feet)	25	50	100	150
AWG* size of cord	18	18	16	14

*AWG-American Wire Gauge

9. ASSEMBLY INSTRUCTIONS

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

10. FEATURES



1. AC Power cord
2. Digital display
3. Battery type button
4. Charging status LED indicator
5. Hook attachment
6. Ring terminal quick-connect
7. Battery clamp quick-connect

11. CONTROL PANEL

DIGITAL DISPLAY

The digital display indicates the status of the battery and charger. See the *Display Messages* section for a complete list of messages.

NOTE: During charging, the display will go into sleep mode and will not display any messages. To turn the display back on, press the battery type button.

BATTERY TYPE BUTTON

Press button once to select lead-acid; twice for a lithium ion battery.

LED INDICATOR

GREEN LED solid (CHARGING): The charger is charging the battery.

GREEN LED pulsing (CHARGED/MAINTAINING): The battery is fully charged and the charger is in maintain mode.

GREEN LED flashing: The charge has aborted (see *Aborted Charge* section).

12. OPERATING INSTRUCTIONS

IMPORTANT: Do not start the vehicle with the charger connected to the AC outlet, or it may damage the charger and your vehicle.

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.

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, or use the convenient hook attachment to hang the unit safely outside the work area.
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.
9. When the charger starts, the **GREEN LED** will be solid, and the display will show **ANALYZING BATTERY** while the charger determines that the battery is properly connected and the condition of the battery.
10. Monitor the progress of the charge by pressing the button on the front of the unit. When the battery is fully charged, the **GREEN LED** will pulse.
11. When charging is complete, disconnect the charger from the AC power, remove the clamp 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.
6. When the charger starts, the **GREEN LED** will be solid, and the display will show **ANALYZING BATTERY** while the charger determines if the battery is properly connected and the condition of the battery.
7. Monitor the progress of the charge by pressing the button on the front of the unit. When the battery is fully charged, the **GREEN LED** will pulse.
8. When charging is complete, disconnect the charger from the AC power, disconnect the negative clamp, and finally the positive clamp.
9. A marine (boat) battery must be removed and charged on shore.

USING THE QUICK-CONNECT CABLE CONNECTORS

Connect either of the output cable assemblies to the charger in a matter of seconds.

IMPORTANT: Never connect the clamp and ring terminal connectors together for use in other applications, such as external battery or other power source charging, or to extend the output cable length, as reverse polarity and/or overcharge conditions will occur.

BATTERY CLAMP QUICK-CONNECT

1. Connect the end of the charger output cable to the end of the battery clamp quick-connect.
2. Follow the steps in previous sections to connect the output clamps to the battery.
3. After a good electrical connection is made to the battery, plug the power cord into a live grounded 120V AC outlet.
4. Select the battery type.
5. When charging is complete, disconnect the AC cord from the outlet, remove the negative clamp, and finally the positive clamp.

RING TERMINAL QUICK-CONNECT

The ring connectors permanently attach to the battery, providing easy access to quickly connect the charger to your battery. This application is appropriate for motorcycles, lawn tractors, ATVs and snowmobiles.

1. To permanently attach to a battery, loosen and remove each nut from the bolt at the battery terminal.
2. Connect the red POSITIVE connector ring to the POSITIVE battery terminal.
3. Connect the black NEGATIVE connector ring to the NEGATIVE battery terminal.
4. Replace and tighten the nuts to secure.
5. Connect the cable to the end of the charger output cord. Take care to keep the wires and plug away from metal and moving parts.
6. Plug the charger power cord into a live grounded 120V AC outlet.
7. Select the battery type.
8. When charging is complete, disconnect the AC cord from the outlet, and then disconnect the quick-connect cable from the charger output cord.

BATTERY CHARGING TIMES

CCA = Cold Cranking Amps Ah = Amp Hour RC = Reserve Capacity

BATTERY SIZE/RATING		CHARGE TIME (3A)
SMALL BATTERIES Motorcycle, garden tractor, etc.	6-12 Ah	1½-2½ h
	12-32 Ah	2½-7 h
CARS AND TRUCKS	200-315 CCA	40-60 RC
	315-550 CCA	60-85 RC
	550-1000 CCA	85-190 RC
MARINE/DEEP-CYCLE		MAINTAIN ONLY
	80 RC	11¼ h
	140 RC	MAINTAIN ONLY
	160 RC	MAINTAIN ONLY
	180 RC	MAINTAIN ONLY

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

AUTOMATIC CHARGING MODE

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

BATTERY CONNECTION INDICATOR

If the charger does not detect a properly connected battery, charging will not start and the digital display will show one of two messages. If the display shows **CONNECT CLAMPS**, make sure the charger is connected to the battery and the connection points are clean and making a good connection. If the display shows **WARNING CLAMPS REVERSED**, unplug the charger from the AC outlet, reverse the connections at the battery, and then plug the charger back in.

CHARGE COMPLETION AND MAINTAIN MODE (FLOAT MODE MONITORING)

Charge completion is indicated by the **GREEN LED pulsing** and the digital display showing **FULLY CHARGED AUTO MAINTAINING**. This means that the charger has stopped charging and has switched to the Maintain Mode of operation. **NOTE:** 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. Make sure there are no loads on the battery. If there are, remove them. If there are none, have the battery checked or replaced.

MAINTAINING A BATTERY

This unit maintains 12 volt batteries, keeping them at full charge. It can charge small batteries and maintain both small and large batteries. If you are maintaining a fully charged large battery, you are properly utilizing the battery charger. However, if you use this battery charger to charge a large battery, such as a marine deep-cycle battery, that was not fully charged, you may lose some of the battery's capacity. **Therefore, we do not recommend charging a large battery with this unit. 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.

DESULFATION MODE

If the battery is left discharged for an extended period of time, it could become sulfated and not accept a normal charge. If the charger detects a sulfated battery, the charger will switch to a special mode of operation designed for such batteries. If successful, normal charging will resume after the battery is desulfated. Desulfation could take up to 8 hours. If desulfation fails, charging will abort, the **GREEN LED will flash**, and the display will show **CHARGE ABORTED-BAD BATTERY**.

ABORTED CHARGE

If charging cannot be completed normally, charging will abort. When charging aborts, the charger's output is shut off, the **GREEN LED will flash**, and the display will show **CHARGE ABORTED-BAD BATTERY**. Do not continue attempting to charge this battery. Check the battery and replace, if necessary.

13. DISPLAY MESSAGES

SELECT BATTERY TYPE (no LED lit) – Waiting for user to select battery type.

CONNECT CLAMPS TO LITHIUM ION BATTERY (no LED lit) – Plugged into the AC outlet, and lithium-ion battery type is selected, without the clamps connected to a battery.

LITHIUM ION BATTERY-PRESS AGAIN FOR LEAD ACID (no LED lit) – Charging will begin for lithium-ion battery type. Press again to change to lead-acid battery type.

CONNECT CLAMPS TO LEAD-ACID BATTERY (no LED lit) – Plugged into the AC outlet, and lead-acid battery type is selected, without the clamps connected to a battery.

LEAD-ACID BATTERY-PRESS AGAIN FOR LITHIUM ION (no LED lit) – Charging will begin for lead-acid battery type. Press again to change to lithium ion battery type.

WARNING-CLAMPS REVERSED (no LED lit) – Plugged into the AC outlet and the clamps are connected backwards to a 12V battery.

ANALYZING BATTERY (green LED lit) – Plugged into the AC outlet, and when first correctly connected to a battery.

CHARGING – XX% (green LED lit) – Plugged into the AC outlet and correctly connected to a discharged battery.

FULLY CHARGED-AUTO MAINTAINING (green LED pulsing) – Plugged into the AC outlet and correctly connected to a fully charged battery.

CHARGE ABORTED-BAD BATTERY (green LED flashing) – Circumstances that could cause an Abort situation during charging:

- The battery is severely sulfated or has a shorted cell and can't reach a full charge.
- The battery is too large or there is a bank of batteries and it doesn't reach full charge within a set time period.

Circumstances that could cause an Abort situation during maintain:

- The battery is severely sulfated or has a weak cell and will not hold a charge.
- There is a large draw on the battery and the charger has to supply its maximum maintain current for a 12 hour period to keep the battery at full charge.

BATTERY DISCONNECTED (no LED lit) – After charging has begun, the charger has lost its connection to the battery.

14. 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, on or around metal, or clipped to the cables.

15. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery clamps do not spark when touched together.	The charger is equipped with an auto-start feature. It will not supply current to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.	No problem; this is a normal condition.
The charger will not turn on when properly connected.	AC outlet is dead. Poor electrical connection.	Check for open fuse or circuit breaker supplying AC outlet. Check power cord and extension cord for loose fitting plug.
Green LED is solid and the display shows ANALYZING BATTERY .	The charger needs to check the condition of the battery.	The Green LED will be solid when the charger is checking the condition of the battery. This is normal.
Green LED is flashing and the display shows CHARGE ABORTED-BAD BATTERY .	The battery is bad. The battery is too large for the charger.	Disconnect charger from the AC outlet and then remove the clamps. Do not continue to try to charge the battery. Have the battery checked or replaced. You need a charger with a higher amp rate.
The display shows CONNECT CLAMPS .	The clamps are not making a good connection. The fuse is bad.	Check for poor connection at battery and frame. Replace the in-line fuse for the ring connector or 12V plug.

16. REPLACEMENT PARTS

Battery clamps (quick-connect)3899002636Z
Ring connectors (quick-connect)2299001950Z

17. BEFORE RETURNING FOR REPAIRS

For REPAIRS OR RETURNS, visit 365rma.com
Visit batterychargers.com for Replacement Parts.

18. LIMITED WARRANTY

For information on our one year limited warranty, please visit batterychargers.com or call 1-800-621-5485 to request a copy.
Go to www.batterychargers.com to register your product online.

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