

Minuteman[®]

24 VOLT AUTOMATIC DUAL MODE BATTERY CHARGER PART NO. 957722 & 957733

Specifications

AC Input:	120 Volts AC, 60 Hertz, 5 amps, single-phase
DC Output:	24 Volts DC, 12 amps tapering to 3 amps
Battery Size:	50 to 120 amp hours
Normal Recharge Time:	8 hours
Battery Capacity:	Two series connected, 6 cell, 12 volt deep-cycle motive power batteries. Gel cell and sealed "maintenance-free" or conventional replaceable electrolyte deep-cycle batteries

PLEASE SAVE THESE IMPORTANT SAFETY AND OPERATING INSTRUCTIONS

For correct operation of the equipment, it is important to read and be familiar with this entire manual before installing and operating the charger.
DO NOT DISCARD THIS MANUAL AFTER READING.



LOOK FOR THIS SYMBOL TO POINT OUT SAFETY PRECAUTIONS. IT MEANS: *BECOME ALERT—YOUR SAFETY IS INVOLVED.* IF YOU DO NOT FOLLOW THESE SAFETY INSTRUCTIONS, INJURY OR PROPERTY DAMAGE CAN OCCUR.

IMPORTANT SAFETY INSTRUCTIONS

Read and familiarize yourself with this entire manual before installing or operating the charger. Follow all instructions on the battery, battery-powered equipment and battery charger. This manual contains important safety and operating instructions for your battery charger.

⚠ DANGER: USE OF AN ATTACHMENT NOT RECOMMENDED OR SOLD BY BATTERY CHARGER MANUFACTURER MAY RESULT IN A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

INTRODUCTION

The Dual-Mode battery charger is designed to recharge deep-cycle batteries of conventional replaceable electrolyte or gel-cell and sealed

"maintenance-free" design. The different charge characteristics required by these different types of battery design are selected by sliding the "BATTERY TYPE" selector switch to the correct setting. A patented electronic circuit turns the charger on and off automatically.

Batteries used on industrial equipment are subjected to severe deep-cycle duty on a daily basis. For this reason, it is important that only Deep-cycle batteries be used.

⚠ CAUTION: THIS CHARGER IS FOR USE ONLY ON 12 CELL, 50-120 AMP-HR. (20 HR. RATE), 2.38-2.50 VOLTS PER CELL MAXIMUM VOLTAGE RECHARGEABLE, DEEP-CYCLE BATTERY SYSTEMS. THIS CHARGER IS FOR USE ON REPLACEABLE ELECTROLYTE OR GEL CELL AND SEALED "MAINTENANCE-FREE" DEEP-CYCLE BATTERIES. THE "BATTERY

TYPE" SWITCH MUST BE SET TO THE PROPER TYPE OF BATTERY. BATTERIES IMPROPERLY MATCHED WITH CHARGER MAY BURST, CAUSING PERSONAL INJURY AND DAMAGE TO BATTERIES OR CHARGER.

INSTALLATION

Circuit breaker or fuse protection in the 120 volt AC outlet to which the charger is to be plugged should allow 7 amps per charger. Do not overload electrical outlet. Use of an extension cord with the charger should be avoided unless necessary. Use of an improper extension cord could result in a risk of a fire and electric shock. If an extension cord is needed, use a three-conductor, No. 14 AWG (or larger) cord with ground, properly wired, in good electrical condition and keep as short as possible. Make sure that the pins on the plug of the extension cord are the same number, size, and shape as that of the plug on the battery charger. Locate all cords so that they will not be stepped on, tripped over, or otherwise subjected to damage or stress. Do not operate the battery charger with a damaged cord or plug. Do not operate the battery charger, if the battery charger has received a sharp blow, or was dropped, or otherwise damaged in any manner. Refer to a qualified service agent.

Provide adequate ventilation for both batteries and charger. The convection-cooled design requires an unobstructed flow of cooling air for proper operation. Keep all charger ventilation openings at least two inches (2") (5.08cm) away from walls and other objects. Do not allow clothing, blankets, or other material to cover charger.

⚠ WARNING: CHARGERS CAN IGNITE FLAMMABLE MATERIALS AND VAPORS. DO NOT USE NEAR FUELS, GRAIN DUST, SOLVENTS, THINNERS, OR OTHER FLAMMABLES.

⚠ WARNING: KEEP THIS CHARGER DRY; DO NOT EXPOSE TO RAIN OR SPRAY. FOR STORAGE, KEEP IN A BUILDING. REPLACE WORN, CUT, OR DAMAGED ELECTRICAL CORDS AND PLUGS IMMEDIATELY.

AC INPUT

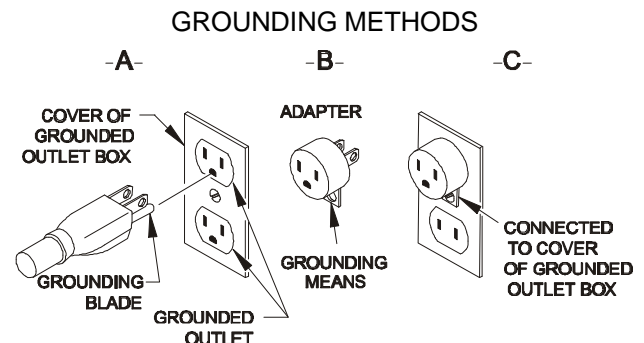
This battery charger must be grounded to reduce the risk of electric shock. It is equipped with an electric cord having an equipment-grounding conductor and a grounding-type plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with the National Electrical Code and local codes and ordinances.

⚠ DANGER: IMPROPER CONNECTION OF THE EQUIPMENT-GROUNDING CONDUCTOR CAN RESULT IN RISK OF ELECTRIC SHOCK. DO NOT REMOVE GROUNDING PRONG FROM PLUG.

⚠ DANGER: BEFORE USING THE ADAPTER AS ILLUSTRATED, BE CERTAIN THAT THE CENTER SCREW OF THE OUTLET PLATE IS GROUNDED.

GROUNDING INSTRUCTIONS

This battery charger is equipped with a grounding plug as illustrated in Figure A, for use on a nominal 120 volt, 60 Hertz circuit. A temporary adapter, as illustrated in Figures B and C, may be used to connect this plug to a two-pole receptacle as shown in Figure B if a properly grounded outlet is not available. The temporary adapter should be used only until a qualified electrician can install a properly grounded outlet. The GREEN colored rigid ear extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.



NOTE: Use of adapter shown in Figures B and C is not permitted in Canada.

BATTERY TYPE

Battery manufacturers frequently use the same battery cases for different battery types. Replaceable liquid electrolyte deep-cycle batteries have removable cell caps. Water electrolyzed by discharging and charging the battery is replaced through these openings.

Non-removable cell caps generally distinguish gel cell and sealed "maintenance-free" deep-cycle batteries. The physical appearance of the battery case is frequently the same as that of a replacement liquid electrolyte battery, although the cell caps are generally not removable.

Refer to the battery manufacturer information panel on the battery case to determine the type battery you have. If the information panel is missing or not legible, do not use the battery. Refer to your dealer

if you do not understand what type battery you are using and have them set the "BATTERY TYPE" switch accordingly.

The "BATTERY TYPE" switch is a two-position slide switch visible in the rectangular opening on the front of the charger. Using a small screwdriver, slide the switch from one setting to the other through the opening. Take care not to damage the switch when moving it to the desired setting.

NORMAL OPERATION

Instructions printed on cover of charger are for daily reference.

1. Set "BATTERY TYPE" switch to the proper style of battery to be charged.

CAUTION: MAKE SURE THE BATTERY PACK IS A 24-VOLT, 12-CELL, SERIES CONNECTED, 50-120 AMP-HOUR (20 HR. RATE), RECHARGEABLE DEEP-CYCLE BATTERY SYSTEM. THE "GEL CELL AND SEALED DEEP-CYCLE BATTERY" SETTING CHARGES TO A MAXIMUM ON-CHARGE VOLTAGE OF 2.38 VOLTS PER CELL. THE "REPLACEABLE ELECTROLYTE DEEP-CYCLE BATTERY" SETTING HAS AN ON-CHARGE VOLTAGE OF AT LEAST 2.50 VOLTS PER CELL. VISUALLY CHECK THAT THE BATTERY TYPE SWITCH IS SET CORRECTLY FOR THE TYPE OF BATTERY YOU ARE USING.

DANGER: TO PREVENT ELECTRIC SHOCK, DO NOT TOUCH UNINSULATED PARTS OF THE CHARGER DC OUTPUT CONNECTOR, BATTERY CONNECTOR, OR BATTERY TERMINALS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.

2. Move the power switch to "OFF" position.
3. Connect the power supply cord to a properly grounded, 120-volt, 60 Hertz single-phase outlet.
4. Connect the charger's DC output plug to the equipment-charging receptacle. Do not connect the DC plug unless the power switch is in the "OFF" position.
5. Move the power switch to "ON" and the RED and GREEN lights will come on steady for a few seconds to test the lights. If the lights do not come on, either the AC cord is not plugged in or the AC outlet is not live. Test for a live AC outlet

by connecting a suitable appliance into the specific outlet.

WARNING: CHARGER IS NOT TO BE USED WHILE THE EQUIPMENT IS OPERATING.

ATTENTION: *Ne pas utiliser le chargeur pendant que l'équipement est en marche.*

WARNING: LEAD-ACID BATTERIES GENERATE GASES THAT CAN BE EXPLOSIVE. TO PREVENT ARCING OR BURNING NEAR BATTERIES, DO NOT DISCONNECT DC CHARGING CORD FROM BATTERIES WHEN THE CHARGER IS OPERATING. IF THE CHARGE CYCLE MUST BE INTERRUPTED, MOVE THE POWER SWITCH TO "OFF" AND DISCONNECT THE CHARGER POWER SUPPLY CORD BEFORE DISCONNECTING THE DC OUTPUT CORD FROM THE BATTERIES. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES.

WARNING: ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT.

Charger will output power three to five (3-5) seconds after turning switch "ON" as indicated by the RED light turning off, the slow blinking GREEN light (once per second), and a slight transformer hum.

If both lights go off about five seconds after AC is applied, check to see if the DC plug is correctly connected to the battery. If the DC plug is connected properly, either an open circuit exists in the equipment's internal circuitry, or the battery voltage is below 7 volts (see Troubleshooting).

The charger has an under-voltage protection mode, which will terminate the charge if battery voltage does not increase above 18 volts after 10 minutes of charging. This prevents destroying 12-volt battery systems with this 24-volt charger. When this occurs, the RED light will come on steady.

6. Correct initial charge rate should be between 11 to 13 amps. As the batteries become more charged the charge rate decreases. When the batteries reach approximately 80% of full charge, the GREEN light will fast blink (eight times per second), the charge rate will have decreased as determined by the "BATTERY TYPE" switch setting and the condition of the batteries.

Replaceable Electrolyte Deep-Cycle Batteries

With healthy batteries, the charging current will decrease to between 2 to 4 amps and remain there until the charger turns off. As replaceable electrolyte deep-cycle batteries lose capacity, the charge rate may no longer decrease to this reading. The charger will still determine when the batteries are as charged as they are capable of being and will turn off. When battery capacity has decreased to where the charger is no longer able to taper down to less than 4 amps, or the batteries will no longer perform as desired, they should be replaced.

Gel Cell and Sealed Deep-cycle Batteries

The charging current will decrease to near zero and remain there until the charger turns off. Gel cell deep-cycle batteries will still taper to near zero charge current even as they wear out and lose capacity and range. As sealed deep-cycle batteries lose capacity and range, the charge current may no longer decrease to this low a reading. The charger will still determine when the batteries are as charged as they are capable of being and turn off. When the batteries will no longer perform as desired, they should be replaced.

7. Charger is equipped with thermal breakers that automatically turn the charger off if it overheats. Should charger turn off before the batteries are fully charged, check to be sure that all of the ventilation openings are free from obstructions. After charger cools down to a safe temperature, it will automatically restart. If charger repeatedly overheats, refer to a qualified service agent.
8. Charger turns off automatically when batteries are fully charged as indicated by steady on GREEN light. Charge time varies with battery size and depth of discharge. Allow 8 hours for normal charging. Larger batteries (greater than 120 ampere-hours) or severely discharged batteries may require up to 16 hours to be properly charged and equalized. If the charger operates for 16 hours and is unable to fully charge the batteries, an internal timer turns the charger off and begins a fast blink of the RED light. A maximum voltage shutoff for wet batteries is an additional safety feature of the charger. When the battery potential increases above 2.83 volts per cell, the charger cycle is terminated and the RED light begins to slow blink.
9. After the charger has turned off, move the power switch to the "OFF" position, disconnect AC cord first, then disconnect the DC output cord from the equipment charging receptacle.

⚠ CAUTION: TO AVOID DAMAGE TO THE CHARGER CORD AND BATTERY CONNECTOR, DISCONNECT BY GRASPING THE PLUG

HANDLE OR BODY AND PULLING IT STRAIGHT OUT OF THE BATTERY CONNECTOR. DO NOT PULL ON THE CHARGER CORD. DO NOT TWIST, ROCK OR PULL THE PLUG SIDEWAYS.

⚠ WARNING: TO PREVENT ARCING OR BURNING NEAR THE BATTERIES, DO NOT DISCONNECT THE OUTPUT CORD FROM THE BATTERIES WHILE THE CHARGER IS OPERATING. IF THE CHARGE CYCLE MUST BE INTERRUPTED, FIRST SLIDE THE POWER SWITCH TO THE "OFF" POSITION, DISCONNECT AC CORD, FOLLOWED BY DISCONNECTING THE OUTPUT CORD FROM THE BATTERIES. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES.

⚠ WARNING: DO NOT LEAVE THE DC OUTPUT CONNECTOR PLUGGED IN WHILE UNATTENDED FOR MORE THAN TWO (2) DAYS. SEVERE OVERCHARGING AND DAMAGE TO THE BATTERIES MAY RESULT IF THE CHARGER DOES NOT TURN OFF.

PROPER CARE OF DEEP-CYCLE MOTIVE POWER BATTERIES

Batteries used on industrial equipment are subjected to severe deep-cycle duty on a daily basis. For this reason, it is important that only deep-cycle batteries be used. Although these batteries are designed to withstand such duty, the following precautions must be observed to obtain good performance and maximum cycle life.

⚠ CAUTION: ALWAYS WEAR PROTECTIVE CLOTHING AND EYE SHIELDS WHEN WORKING WITH BATTERIES. BATTERIES CONTAIN ACID THAT CAN CAUSE BODILY HARM. DO NOT PLACE WRENCHES OR OTHER METAL OBJECTS ACROSS THE BATTERY TERMINALS OR BATTERY TOP. ARCING OR AN EXPLOSION OF THE BATTERY MAY RESULT. SOMEONE SHOULD BE WITHIN THE RANGE OF YOUR VOICE OR CLOSE ENOUGH TO COME TO YOUR AID WHEN YOU WORK NEAR A LEAD-ACID BATTERY. HAVE PLENTY OF FRESH WATER AND SOAP NEARBY IN CASE BATTERY ACID CONTACTS SKIN, CLOTHING OR EYES.

⚠ WARNING: RISK OF EXPLOSIVE GASES. WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. IT IS VERY IMPORTANT THAT YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY, EACH TIME BEFORE USING YOUR CHARGER.

1. New batteries should be given a full charge before their first use because it is difficult to know how long batteries have been stored.
2. Limit use of new batteries for first 5 cycles. New batteries are not capable of their rated output until they have been discharged a number of times.
3. Do not excessively discharge batteries. Excessive discharge can cause polarity reversal of individual cells resulting in complete failure shortly thereafter. Limited use of new batteries will minimize the chance of cell reversal.
4. Check the level of the electrolyte in conventional liquid electrolyte lead-acid batteries monthly. Maintain the proper electrolyte level by adding water when necessary. Electrolyte levels lower during discharge and rise during charge. Therefore, it is mandatory that water be added to cells ONLY when they are fully charged; do not overfill. Old batteries require more frequent additions of water compared to new batteries.
5. Keep the tops of batteries clean and dry to prevent excessive self-discharge. Keep the battery terminals reasonably tight.

PERSONAL PRECAUTIONS

1. Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear complete eye and clothing protection and avoid touching eyes while working near battery.
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.
5. Never smoke or allow a spark or flame in vicinity of battery.
6. 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.
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 current high enough to weld a ring or other metal material, causing a severe burn.
8. Never charge a frozen battery.

TROUBLESHOOTING

⚠ CAUTION: DO NOT DISASSEMBLE THE CHARGER. TAKE THE CHARGER TO A QUALIFIED SERVICE AGENT WHEN SERVICE OR REPAIR IS REQUIRED. INCORRECT REASSEMBLY MAY RESULT IN A RISK OF ELECTRIC SHOCK OR FIRE.

The following procedures are intended only to determine if a malfunction may exist in the charger, or in the equipment and batteries.

⚠ DANGER: TO REDUCE RISK OF ELECTRIC SHOCK, ALWAYS DISCONNECT BOTH THE POWER SUPPLY CORD AND THE OUTPUT CORD BEFORE ATTEMPTING ANY MAINTENANCE OR CLEANING.

⚠ CAUTION: DO NOT OPERATE THE CHARGER IF IT IS DAMAGED OR APPEARS TO BE MALFUNCTIONING. PERSONAL INJURY OR DAMAGE TO THE CHARGER AND/OR BATTERIES MAY RESULT.

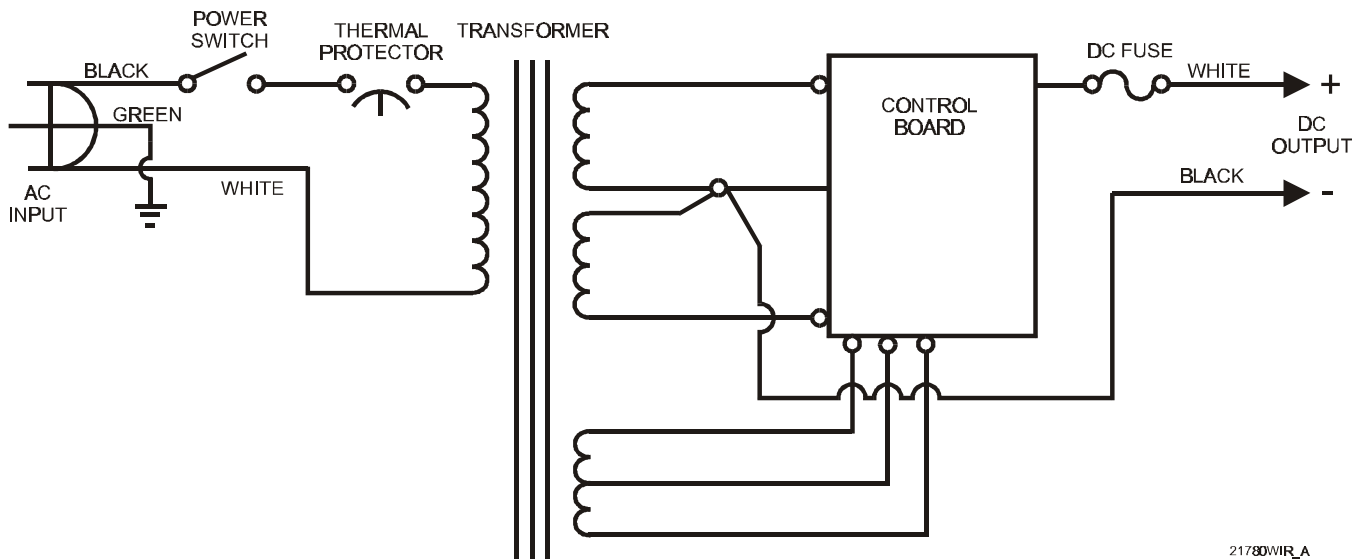
Use the following chart to help you troubleshoot problems with the battery and charger system. There are four different modes that each light can have: OFF (light is off), SLOW BLINK (light blinks on and off once per second), FAST BLINK, (light blinks on and off eight times per second), and STEADY (light is full on).

RED LIGHT	GREEN LIGHT	FUNCTION
Off	Off	No AC power or No battery connected
Steady	Steady	Light test when AC connected
Low Glow	Slow Blink	Charging (less than 80% charged)
Low Glow	Fast Blink	Charging (over 80% charged)
Low Glow	Steady	Normal charge completed
Low Glow	Off	AC power connected, not charging
Steady	Off	Under voltage shutoff, < 18.0 volts
Slow Blink	Off	Over voltage shutoff, > 33.96 volts
Fast Blink	Off	Max. timer shutoff, > 16 hours

1. If the RED and GREEN lights do not illuminate within three seconds after the AC power is applied to the charger, it indicates one of the following:
 - a. The power switch is not in the "ON" position.
 - b. The charger is not plugged into a live AC outlet.
2. If both lights go off and stay off three to five (3-5) seconds after the charger connections are completed, it indicates one of the following and the charger is prevented from turning on:
 - a. The DC plug is not connected to the equipment receptacle.

- b. A fault has occurred in the equipment wiring. The connections in the wiring are not making proper contact or are making poor contact to the batteries. Have your dealer check for and repair corroded terminals, loose or worn plugs, receptacles, and fuseholders.
 - c. The battery connections in the equipment are wrong (reverse polarity).
 - d. One or both of the batteries are no longer serviceable (voltage below 7 volts for a 24-volt system).
3. If the charger turns off before the batteries are fully charged, it indicates one of the following:
- a. The charger's internal thermal breaker turned the charger off due to overheating. The charger ventilation openings are blocked. After the charger has cooled down to a safe temperature, it will automatically restart. If the charger repeatedly overheats, it may be malfunctioning.
 - b. The AC power was interrupted during the charge.
 - c. The DC cord plug was accidentally disconnected during the charge.
 - d. A fault has occurred in the equipment wiring. The equipment charging circuit has high resistance, or corroded, loose connections, loose or worn charging receptacle, or loose, worn fuseholders.
4. A decrease in equipment range where it loses power faster and faster indicates one of the following:
- a. Using the equipment before the batteries have been fully charged. This shortens battery life and hastens the onset of this reduced daily range. The battery capacity lost in this manner is permanent and is not recovered with additional charge cycles.
 - b. The conventional, replaceable liquid electrolyte batteries are being undercharged on the gel cell "BATTERY TYPE" switch setting. The battery capacity lost in this manner is permanent and is not recovered with additional charge cycles.
 - c. Severe overcharging occurs when gel cell (maintenance free) batteries are charged on the conventional wet lead acid "BATTERY TYPE" switch setting. The battery capacity lost in this manner is permanent and occurs very rapidly. Check with your dealer about battery replacement.
 - d. The batteries have been allowed to sulfate. Charge the batteries more frequently than once every three days when the wheelchair is lightly utilized. Once sulfation is allowed to take place, it may be partially reduced by returning, temporarily, to daily charging.
- e. The electrolyte level in conventional, liquid electrolyte lead-acid batteries was allowed to drop below the top of the battery plates. Add distilled water to just cover the tops of the plates immediately upon discovery and fill to the proper level with distilled water at the completion of the next charge cycle. Battery capacity lost in this manner is permanent and is not recovered with additional charge cycles.
 - f. This is the normal wearout process for all types of deep-cycle motive power batteries.
5. If battery voltage does not exceed 18 volts after 10 minutes of charging, the charger turns off and the RED light will turn on steady, indicating one of the following:
- a. An improper battery is being used with the charger. The batteries must be 12 cell, series connected 2.38-2.50 volts per cell battery system.
 - b. There are failed cells in the batteries being charged. This cell failure prevents the battery voltage to rise above 18 volts.
6. If the charger operates through 16 hours before turning off, the RED light will begin to blink very rapidly, indicating one of the following:
- a. Batteries of higher than 120 amp-hour capacity (20 hr. rate) can require more than 16 hours to charge.
 - b. New batteries (5 cycles or less) can require more than 16 hours to charge.
 - c. Very deeply discharged batteries (100% discharged) can require more than 16 hours to charge.
 - d. Several failed cells in the batteries that do not allow the charge rate to taper below 4 amps.
7. If battery voltage exceeds 2.83 volts per cell, the charger turns off and the RED light begins to slow blink, indicating one of the following:
- a. An improper battery is being used with the battery charger. The batteries being charged must be a 12 cell, 2.38-2.50 volts per cell battery system.
 - b. The battery being charged has a design that may be inappropriate for this use. Check with your dealer for deep-cycle batteries only.
 - c. Sulfation of batteries may have occurred.

WIRING DIAGRAM



21780WIR_A

PARTS LIST FOR AUTOMATIC DUAL MODE BATTERY CHARGER

QTY.	DESCRIPTION
1	CASE ASSEMBLY OPTION -83
1	CASE ASSEMBLY OPTION -84
1	TRANSFORMER
1	BUSHING, STRAIN RELIEF FOR CORDS
1	CORDSET, DC, 14/2, 108", W/ SB50 RED PLUG
1	CORDSET, DC, 14/2, 108", W/ SB175 RED PLUG
1	CORDSET, AC, 18/3, 102" W/ PLUG
1	CONTROL BOARD ASSEMBLY
1	POWER SWITCH

Use only original factory-replacement parts of the correct size and rating.

LIMITED WARRANTY

Minuteman warrants each new Minuteman Battery Charger for defects in material and workmanship, for a period of one year, from the date of original purchase of the complete unit. Repairs can be made at the Minuteman factory. To do so send the defective unit with transportation charges prepaid to:

Minuteman, Inc.
111 South Rohlwing Road
Addison Illinois, 60101
Attention: Service Department

For repairs made at other than the Minuteman factory, Minuteman will provide only the replacement parts. Defective parts should be sent with transportation charges prepaid to the Minuteman factory at the previously mentioned address.

If the unit or parts are found in the reasonable judgment of Minuteman to be defective in material or workmanship, Minuteman will make repair or replacement without charge for parts or labor. Repair or replacement will be at the discretion of Minuteman, with replacements being made using current models or parts performing the equivalent function. Labor charges other than those incurred at the Minuteman factory are not covered under this warranty. All expenses associated with delivering defective items to the Minuteman factory and the expense of returning repaired or replaced items from the Minuteman factory to the owner will be paid for by the owner. All warranty work accomplished at the Minuteman factory will be completed within a reasonable time after receipt of defective items.

This warranty does not cover any semiconductor parts, such as diodes, which are vulnerable to electrical overloads beyond the control of Minuteman.

This warranty does not cover any charger that has been subject to misuse, neglect, negligence, or accident, or operated in any way contrary to instructions specified on the charger case and in the owner's manual. No claim of breach of warranty shall be cause for cancellation of the contract of sale of any Minuteman charger. Minuteman assumes no responsibility for loss of time, inconvenience, or other damage, consequential or otherwise, resulting from a defective charger. All implied warranties (including merchantability) are limited in duration to the one-year warranty period.

Some states do not allow the exclusion or limitation of incidental or consequential damages; or limitations on how long an implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary, from state to state.

Minuteman's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective items. Minuteman issues this warranty in good faith and with full confidence in the workmanship and quality of Minuteman products.