



**Model MHTX7 Series
Automatic Battery Charger**

User's Manual

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains important safety and operating instructions for Model MHTX7 Battery Chargers. Before using the battery charger, please read all instructions and cautionary markings on the battery charger, the battery, and the product using the battery.

CAUTION - To reduce the risk of electric shock:

- Do not expose unit to rain or moisture.
- Do not remove cover. There are no user serviceable parts inside. Refer service to qualified service personnel.
- Connect the battery charger directly to a grounding receptacle. An adaptor should not be used with this unit. This unit is equipped with a power plug having an equipment grounding conductor (3-prong). The unit must be plugged into an outlet that has been properly installed and grounded in accordance with all local and national codes and ordinances.
- Disconnect charger from AC power and battery before attempting any maintenance or cleaning. Turning off controls may not reduce this risk.

WARNING

- Charge only nickel-metal-hydrate type rechargeable batteries. Attempting to charge other types of batteries may result in personal injury and battery damage.
- The enclosure (metal face) may become hot during the charge cycle - **DO NOT TOUCH!**

DANGER - Never alter power plug blades or ground pin. If it will not fit the outlet, have a proper outlet installed by an electrician. Improper connection will result in the risk of an electric shock or fire.

Make sure cords are located so that they will not be stepped on, tripped over, or otherwise subjected to damage or stress. Do not operate this unit with a damaged cord or plug - replace them immediately. To reduce the risk of damage to electric plug, pull by unit body rather than output cord when disconnecting unit.

Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way. Do not disassemble charger; incorrect reassembly will result in the risk of an electric shock or fire. Refer service to qualified service personnel.

Allow space around unit and adequate air circulation to reduce internal heat buildup. Do not block vents or operate in a small, enclosed space.

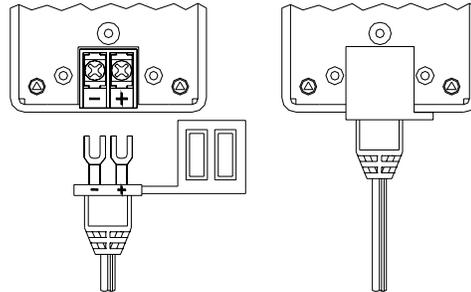
INTRODUCTION

This unit is a two stage, constant current battery charger for charging nickel-metal-hydride type rechargeable batteries. The charge termination is by a 14 hours timer at which time it will switch from the charge current to a low rate current. A 6 feet long output cable with a barrel plug is provided. There are two indicators on the front panel. The orange light indicates that the charger is in the charging mode. The green light indicates that the battery is fully charged.



ASSEMBLY INSTRUCTIONS

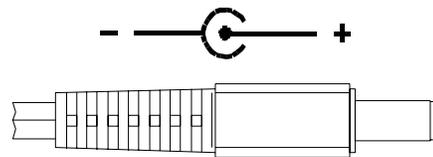
Loosen the screws on the charger output terminal strip. Identify the polarity of the terminal strip and the output connector; both the charger housing and the output cable are marked with “+” & “-” symbols. Insert the two spade terminals under the terminal strip screws and tighten. To prevent accidental shorting, cover the exposed terminals with the molded press-on terminal cover.



If using loose wires, insert stripped ends under washers. A cable having a shield may be grounded to the bottom hole using a number 6-32 x 1/4” machine screw.

OPERATING INSTRUCTIONS

Before using this battery charger, make sure it is compatible with your battery. Refer to the ratings on the battery charger, the specifications in this manual, and your battery documentation. Charge only nickel-metal-hydride type rechargeable batteries; attempting to charge other types of batteries may result in battery damage. This unit is provided with a polarized barrel plug connector. Make sure your battery connector is wired to match the output connector.



CAUTION: This unit is not reverse battery protected except by use of the polarized connector. Make sure your battery connector is wired to match the charger connector or damage to the battery and charger may result when power is applied. While in a reversed condition the charger will indicate that it is in the charging mode. However, it may actually be discharging the battery until either the battery or charger is damaged.

CAUTION: This unit is not short circuit protected - it will deliver the full rated current into a short. If the short is not removed, the charger may overheat and be damaged. While in a shorted condition the charger will indicate that it is in the charging mode. If the charging light is on while not connected to a battery then there is probably a short in the output cable or connector. Remove the output cable and see if the charge light goes out with the charger plugged back in. If the light stays on without an output cable connected then there is a problem with the charger.

Plug the battery charger into a properly grounded (3-prong) wall outlet which supplies the correct input power as marked on the unit. The indicators should be dark until a battery is attached.

Attach the output connector to the battery connector. The charger should now be on and charging the battery. The orange charging indicator should light. If the green ready indicator lights instead then the battery voltage may be too high (too many cells). The battery must be a 1.2 to 14.4 volts (1 to 12 cells) battery.

The orange charging light indicates that the charger is on and charging the battery. The charger will deliver a constant current to the battery for 14 hours. After this time, the unit will switch into the ready mode - the charging indicator will darken and the green ready indicator will light. At this point the battery is fully charged. When the charger is in the ready mode, a low rate constant current (1/4 that of the rated output current) is delivered to the battery to keep it fully charged. Most nickel-metal-hydride batteries may be left connected to the charger in the ready mode, for some time, without a danger of damaging them. However, many manufacturers do not recommend trickle charging their nickel-metal-hydride batteries. We recommend you refer to the battery manufacturer's documentation for the suitability of trickle charging your battery.

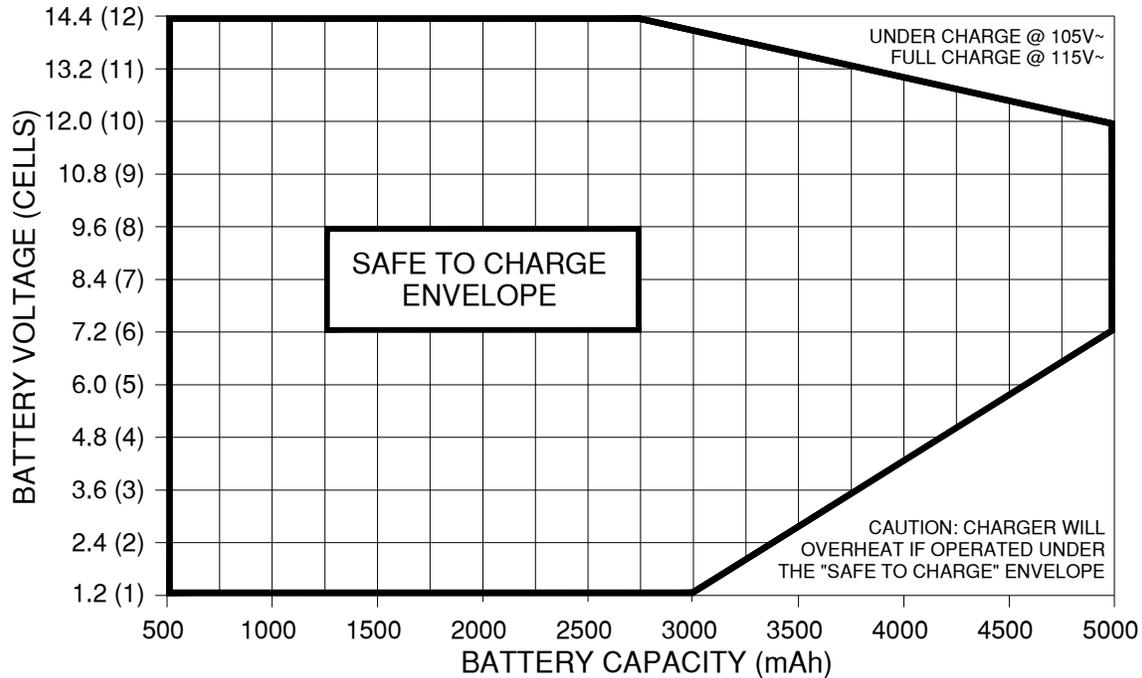
CHARGING NOTES AND TIPS

The batteries should be fully discharged before being put onto charge. This has two benefits: the batteries will not be overcharged, although it is a fairly benign overcharge, and they will be less likely to develop a "memory effect".

The *safe charging curve* graph on the next page represents what size batteries, based on voltage and capacity, can be properly charged using this charger. The charger is designed to charge batteries at the C/10 charge rate (capacity ÷ 10). If your battery capacity is 2.8 Ah (2800 mAh) then the charger should be rated for 280 mA (2800 ÷ 10). Refer to your battery documentation to see if the charger is appropriate to charge your battery.

Example: If your charger is rated for 400 mA then it will charge 4 Ah batteries between 4.8 to 13.2 volts (4 to 11 cells). It will charge a 14.4 volt (12 cells) battery as long as the charger receives a full 115 volts ac input. If the input voltage is below 115 volts at that charge voltage, the maximum current will begin to drop and the battery may not be fully charged. Attempting to charge 4 Ah batteries between 1.2 to 3.6 volts (1 to 3 cells) may

cause the charger to overheat and possibly be damaged - the batteries should not be damaged. Batteries smaller than 4 Ah will be overcharged and batteries larger than 4 Ah will be undercharged.



Xenotronix/TLI can make custom units, or modify our existing units, to exactly match your charging needs. Call our sales department for technical information and pricing.

Following are *some* of the modifications we can perform:

- Custom match the charge current to your battery capacity
- Adjust the charge times for a faster or slower recharge
- Provide custom cables and connectors
- Private labeling

TROUBLESHOOTING

NO INDICATORS LIGHT - If the indicators are both dark when power is applied and the charger is properly attached to a battery, check to see if the receptacle is controlled by a light switch or power strip. It is normal for both indicators to be off with power applied and no battery attached.

CHARGER ENTERS READY MODE TOO SOON - If the ready indicator lights when you first attach the battery or in less than 13 hours then the battery is probably higher than 14.4 volts (12 cells). The charger switches to ready mode if the voltage becomes too high. It may reach this voltage during charge with batteries over 15.6 volts (13 cells).

CHARGER WILL NOT SWITCH TO READY MODE – If, after 15 hours, the charger has not yet switched to the ready mode, try to determine if there was a power interruption or a loose connection, which may have reset the charger timer for another 14 hours.

CHARGING INDICATOR IS ON WITHOUT A BATTERY ATTACHED - This indicates that the output cable or connector may be shorted. If the indicator remains off with the output cable removed then you should replace the cable. Do not attempt to charge a battery with a shorted output cable.

RATTLE - If you think you hear a rattle inside the charger it is probably only a loose terminal strip screw. Once the output cable is attached and the screws are properly tightened, the rattle should go away.

MAINTENANCE INSTRUCTIONS

CLEANING - Unplug the charger and disconnect the battery before attempting any cleaning. If it becomes necessary to clean the enclosure, wipe the enclosure exterior with a damp cloth. If necessary, use a mild detergent. Do not use an abrasive cleanser or spray cleaners directly onto the charger. Do not immerse unit in water.

BATTERY CHARGER SPECIFICATIONS

General Conditions	25 °C (77 °F)
Operating temperature	0 to 40 °C (32 to 104 °F)
Storage temperature	-40 to 80 °C (-40 to 176 °F)
Dimensions	H 3.8" (9.65 cm) x W 2.8" (7.1 cm) x D 2.8" (7.1 cm)
Weight	Less than 1.5 lbs (0.68 kg) with standard output cable
Power Requirements	120 VAC, 60 Hz, 0.2 A

Output Ratings:

Model	MHTX7 (all variants)
Charge Amps	C/10 or 0.1C, where C = Battery Capacity (50 to 500 mA, refer to marking label on unit)
Trickle Amps	C/40 or 0.025C, where C = Battery Capacity (Approximately 1/4 of rated output current)
Charge Timer	14 hours ± 1 hr.
Open Circuit Voltage	Greater than 20 VDC
Battery	Rechargeable nickel-metal-hydride, 1.2 to 14.4 Volts (1 to 12 cells), 500 mAh to 5 Ah

Safety Agency Approval	CSA NRTL/C (USA and Canada)
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DIMENSIONS

