

CMTOOL AQ-82

CMTOOL 36V 25A Lithium Battery Charger User Manual

Model: AQ-82

1. INTRODUCTION

This manual provides essential information for the safe and efficient operation of your CMTOOL 36V 25A Lithium Battery Charger (Model AQ-82). This high-power charger is designed for 36V (38.4V nominal) LiFePO4 batteries, delivering 43.8V 25A (1250W) output. It is suitable for various applications including golf carts, trolling motors, forklifts, RV systems, and industrial battery setups. Please read this manual thoroughly before use and retain it for future reference.

2. SAFETY INSTRUCTIONS

Always observe the following safety precautions to prevent injury or damage to the charger or battery:

- **Battery Compatibility:** This charger is specifically designed for 36V (38.4V nominal) LiFePO4 batteries. Do not attempt to charge other battery types, as this may cause damage or present a safety hazard.
- **Ventilation:** Ensure adequate ventilation around the charger during operation. Do not cover the charger or block its cooling fan.
- **Environmental Conditions:** Operate the charger within the specified working temperature range of -20°C to +45°C. Avoid exposure to direct sunlight, excessive heat, or extreme cold.
- **Water and Moisture:** Although the charger has an IP67 waterproof rating, avoid submerging it or exposing it to excessive moisture unnecessarily. Ensure all connections are dry before use.
- **Electrical Connections:** Ensure all connections are secure and correct polarity is observed (red for positive, black for negative). Loose connections can cause overheating or damage.
- **Power Source:** Connect the charger to a grounded AC power outlet (120 Volts AC). Do not use extension cords unless absolutely necessary, and ensure they are rated for the charger's power requirements.
- **Maintenance:** Do not attempt to open or repair the charger. Refer all servicing to qualified personnel.
- **Children and Pets:** Keep the charger and battery out of reach of children and pets.

3. PRODUCT OVERVIEW

The CMTOOL 36V 25A Lithium Battery Charger is engineered for high performance and durability. Key features include:

- **High Power Output:** 43.8V 25A (1250W) for fast charging.
- **High Efficiency:** Charging efficiency of $\geq 94\%$.
- **Robust Design:** All-aluminum housing for enhanced heat dissipation and IP67 waterproof rating.
- **Smart Temperature Compensation:** Adjusts charging voltage based on ambient temperature (-20°C to +45°C).
- **Comprehensive Protection:** Includes over-voltage, over-current, reverse polarity, short-circuit, and thermal protection.
- **User-Friendly Indicators:** 3-color LED for clear charging status.
- **Certified Quality:** FCC and ETL certified.

3.1 Components

The charger unit includes the following main components:

- Charger Unit with integrated cooling fan and portable handle.
- AC Power Cord (10 ft).
- DC Charging Cable (6 ft) with IP68 waterproof connector and heavy-duty ring terminals.
- LED Indicator Light.



Image 3.1: Overview of the CMTOOL 36V 25A Lithium Battery Charger, showcasing its main features like temperature sensor, 3-color indicator, six charge protections, all-aluminum body, cooling fan, IP67 waterproof and shockproof design, high/low temperature resistance, and FCC/ETL certification.



Image 3.2: Detailed diagram illustrating the charger's dimensions, portable handle, cooling fan, charging indicator, ring terminals, and cable lengths. The charger weighs 3.2 kg (7.05 pounds).

4. SETUP AND INSTALLATION

Follow these steps to set up and install your charger:

1. **Connect DC Charging Cable:** Connect the DC charging cable to the charger unit. Ensure the IP68 waterproof connector is securely fastened by aligning the pins and twisting the blue ring until it locks.
2. **Connect to Battery:** Attach the heavy-duty ring terminals to your 36V LiFePO4 battery. Ensure the red terminal is connected to the positive (+) battery post and the black terminal to the negative (-) battery post. Verify connections are tight and secure.
3. **Connect to AC Power:** Plug the AC power cord into a standard 120V AC grounded outlet.

IP68 WATERPROOF CONNECTOR



Image 4.1: The IP68 waterproof connector ensures a secure and protected connection between the charger and the DC charging cable, preventing water ingress.

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Video 4.1: This video demonstrates the physical components of the CMTOOL 36V Lithium Battery Charger, including the main unit, AC power cord, and DC charging cable with ring terminals. It also shows the connection process for the waterproof DC connector.

5. OPERATION

Once the charger is properly connected to the battery and AC power, it will automatically begin the charging process. The built-in temperature sensor will dynamically adjust the charging voltage based on the ambient temperature to optimize charging performance and battery longevity.

The LED indicator light on the charger provides real-time status updates on the charging process. Refer to the 'LED Indicator Guide' section for detailed explanations of each light pattern.

The charger features a 15-hour safety cutoff to prevent overcharging. Charging time depends on the capacity of the lithium battery being charged.

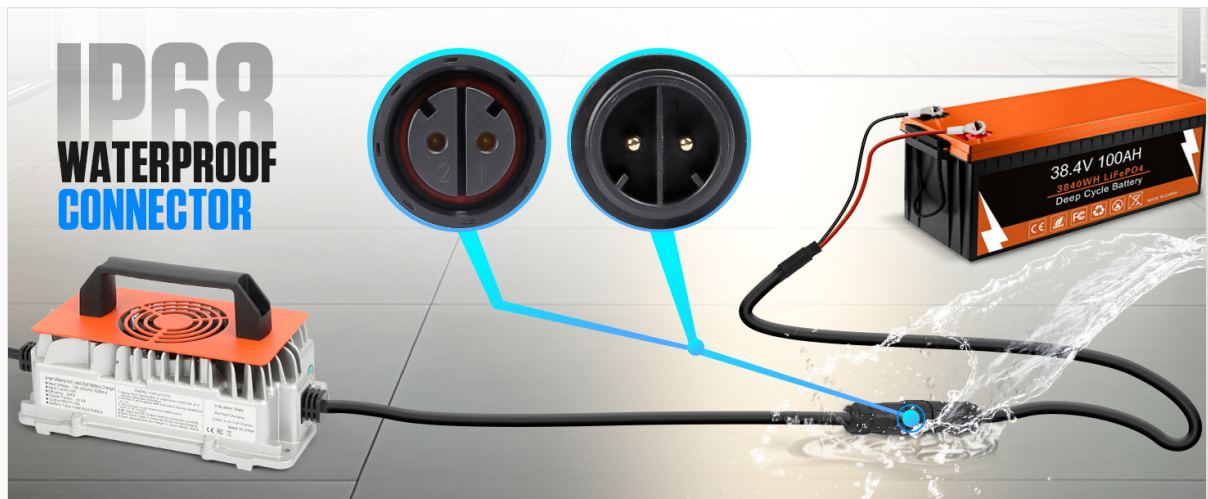


Image 5.1: The charger is designed with a maximum charging time of 15 hours to prevent potential damage to the battery from overcharging. Actual charging duration varies based on the battery's capacity.

6. LED INDICATOR GUIDE

The 3-color LED indicator provides visual feedback on the charger's status:

Indicator State	Description
Red/Green Flash	Waiting mode or no-load (charger is powered but not connected to a battery, or waiting to initiate charge).
Red Flash	Low charging (battery charge level is less than 80%).
Yellow Flash	Normal charging (battery charge level is greater than 80%).
Green Flash	Continuous charging (battery is nearing 100% charge).
Green On	Fully charged (battery has reached 100% charge).

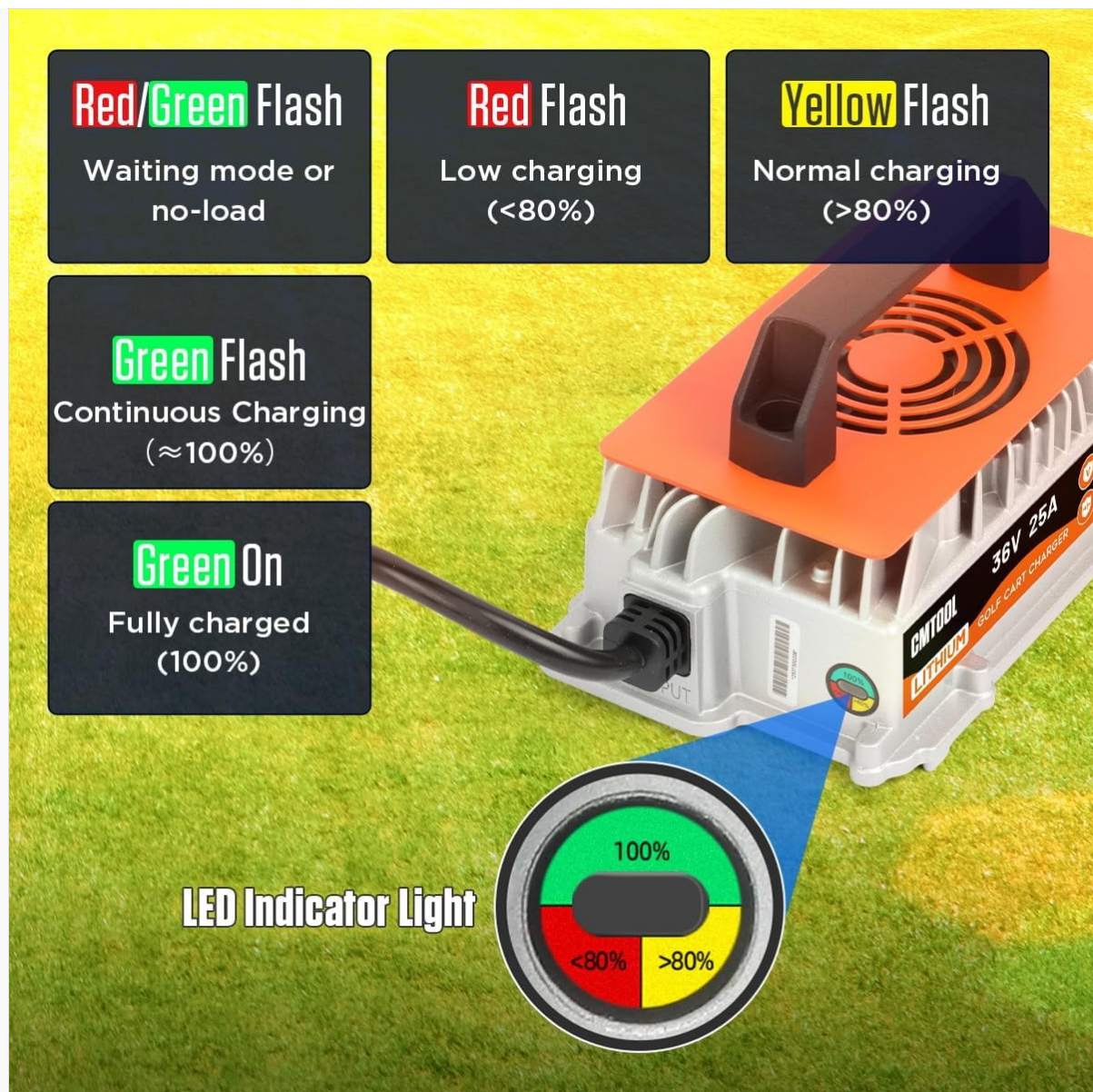


Image 6.1: Visual guide to the LED indicator light, showing the different colors and flash patterns corresponding to waiting, low charge, normal charge, continuous charge, and fully charged states.

7. CHARGING PROTECTION FEATURES

The CMTOOL charger incorporates an advanced lithium battery protection system to ensure safe and reliable operation:

- **Overvoltage Protection:** Prevents charging at excessively high voltages that could damage the battery.
- **Overheating Protection:** If the charger's internal temperature becomes too high, it will automatically shut down. The cooling fan may continue to operate to cool the unit. Charging will resume once the temperature returns to a safe level.
- **Battery Reverse Polarity Protection:** Protects against damage if the battery terminals are connected incorrectly.
- **Overcurrent Protection:** Prevents excessive current flow during charging, safeguarding both the charger and the battery.
- **No-Load Protection:** The charger will not output power if no battery is connected, enhancing safety.

- **Output Short Circuit Protection:** Automatically shuts down if a short circuit is detected at the output.
- **15-Hour Safety Cutoff:** Automatically terminates charging after 15 hours to prevent prolonged charging cycles.



Image 7.1: Visual representation of the charger's safety features, including overvoltage, overheating, battery reverse polarity, overcurrent, no-load, and output short circuit protection.

8. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your charger:

- **Cleaning:** Regularly wipe the charger's exterior with a dry, soft cloth. Do not use harsh chemicals or abrasive cleaners. Ensure the cooling fan vents are free from dust and debris.
- **Storage:** Store the charger in a cool, dry place away from direct sunlight and extreme temperatures. The recommended storage temperature range is -40°C to +90°C.
- **Cable Inspection:** Periodically inspect the AC power cord and DC charging cable for any signs of damage, fraying, or loose connections. Replace damaged cables immediately.
- **Environmental Resistance:** The IP67 waterproof and shock-resistant design makes it suitable for

outdoor and industrial environments. However, proper care and handling are still recommended.

CHARGING TIME CONTROL

It is set with a maximum charging time (15 hours) to avoid damage to the battery caused by overcharging.



Charging time depends on the capacity of the lithium battery.



Image 8.1: The charger's IP67 rating signifies its resistance to dust and water, making it suitable for use in various outdoor conditions.

PRODUCT SPECIFICATIONS

Input Voltage	AC 100V-240V
Input Frequency	50Hz-60HZ
Input Current	≤10A
Max Output Voltage	43.8V
Max Output Current	25A
Output Power	1250W
Work Efficiency	≥92%
Power Factor	≥0.98
Waterproof Level	IP67
Certification	ETL FCC
Working Temperature	-20°C~+45°C
Storage Temperature	-40°C~+90°C

Image 8.2: The charger is designed to operate reliably across a wide temperature range, from -20°C to +45°C, adapting to diverse working environments.

9. TROUBLESHOOTING

If you encounter issues with your charger, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Charger not turning on / No LED activity.	No AC power, faulty power cord, internal fault.	Check AC power connection and outlet. Inspect power cord for damage. If problem persists, contact support.
LED is Red/Green Flashing, but not charging.	Battery not connected, poor battery connection, battery voltage too low or too high.	Ensure DC charging cable is securely connected to both charger and battery. Verify battery voltage is within acceptable range for a 36V LiFePO4 battery.

Problem	Possible Cause	Solution
Charger stops charging unexpectedly.	Overheating, short circuit, overvoltage protection activated, 15-hour safety cutoff reached.	Allow charger to cool down if hot. Check for short circuits or incorrect battery voltage. Note that charging will stop after 15 hours.
Charger is hot during operation.	Normal operation, blocked ventilation.	Some heat is normal. Ensure cooling fan vents are clear and not obstructed. Operate in a well-ventilated area.

10. SPECIFICATIONS

Feature	Specification
Model Number	AQ-82
Input Voltage	120 Volts AC
Output Voltage	43.8 Volts DC
Current Rating	25 Amps
Output Power	1250W
Charging Efficiency	≥ 94%
Max Charging Time	15 Hours
Connector Type	Ring Terminal
Waterproof Level	IP67
Working Temperature	-20°C to +45°C
Storage Temperature	-40°C to +90°C
Certifications	FCC, ETL
Weight	6.39 pounds (approx. 3.2 kg)
AC Power Cord Length	10 ft (3m)
DC Charging Cable Length	6 ft (1.8m)

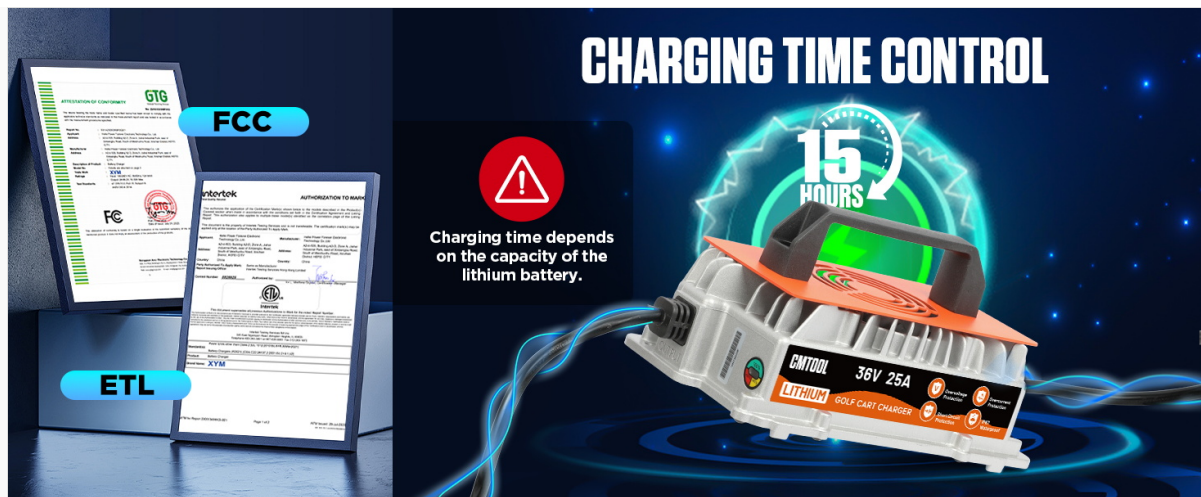


Image 10.1: A summary of the charger's technical specifications, including input/output voltage, current, power, efficiency, temperature ranges, and certifications.

11. WARRANTY AND SUPPORT

The CMTOOL 36V 25A Lithium Battery Charger comes with a **1-year warranty** from the date of purchase, covering manufacturing defects. This warranty does not cover damage caused by misuse, accident, unauthorized modification, or improper installation.

For technical support, warranty claims, or any questions regarding your product, please contact CMTOOL customer service through the retailer where the product was purchased. Please have your model number (AQ-82) and proof of purchase ready when contacting support.