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› Mighty Max Battery ML4D4 12V 200Ah SLA AGM Battery User Manual

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Mighty Max Battery ML4D4 12V 200Ah SLA AGM Battery User Manual

Model: ML4D4 | Brand: Mighty Max Battery

1. INTRODUCTION AND OVERVIEW

The Mighty Max Battery ML4D4 is a 12V 200Ah Sealed Lead Acid (SLA) Absorbent Glass Mat (AGM) rechargeable battery. This maintenance-free battery is UL Certified and designed for various applications, including solar systems. It offers a high discharge rate, wide operating temperature range, long service life, and excellent deep discharge recovery. The spill-proof design allows for mounting in any position, and it resists shocks and vibrations, ensuring high performance in diverse temperature conditions.



Image 1.1: Mighty Max Battery ML4D4 12V 200Ah SLA AGM Battery. This image displays the overall appearance of the ML4D4 battery, highlighting its robust black casing and terminal design.

2. SAFETY INFORMATION

Please read and understand all safety precautions before handling, installing, or operating the battery. Failure to follow these instructions may result in serious injury or property damage.

- **Risk of Fire, Explosion, or Burns:** Do not short-circuit the battery terminals. Avoid contact with sparks, open flames, or heat sources.
- **Temperature Limits:** Do not heat the battery above 40°C (104°F). The storage temperature should not exceed 50°C (122°F).
- **Disassembly:** Do not disassemble the battery. Internal components are hazardous.
- **Non-Spillable Design:** This battery is non-spillable, but proper handling is still required.
- **Recycling:** Batteries must be recycled or disposed of properly according to local regulations. Do not dispose of in

household waste.

- **Protective Gear:** Always wear appropriate personal protective equipment, including safety glasses and gloves, when handling batteries.
- **Ventilation:** Ensure adequate ventilation during charging to prevent accumulation of gases.



ML4D

(12V 200Ah)

Overview

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special oneway valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

General Features

- Positive and negative plates in lead-calcium-tin alloy;
- Stable Quality&High Reliability;
- Sealed Construction;
- Long Service Life;
- Maintenance-Free Operation;
- Low Pressure Venting System;
- Low Self Discharge;
- Six months shelf life at 20°C;
- Design life 10 years

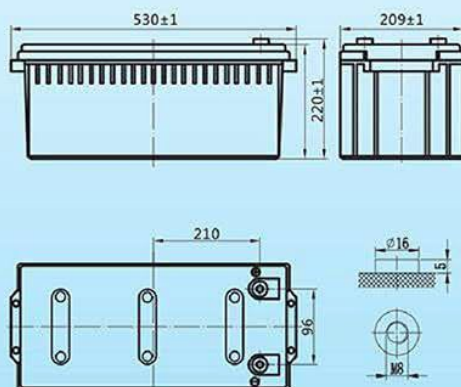
Battery Specification

Performance Characteristics	
Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (17.5A, 10.8V)	200Ah
5 hour rate (31.5A, 10.5V)	157.5Ah
1 hour rate (115A, 9.6V)	115Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	≤4.3 mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	1000A(5s)
Short Circuit Current	3430A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	2.40-2.45V/PC
Maximum charging current	52.5A
Temperature compensation	-30mV/°C
Standby use	2.20-2.30V/PC
Temperature compensation	-20mV/°C

Dimensions and Weight

Length(mm / inch)	530 / 20.9
Width(mm / inch)	209 / 8.23
Height(mm / inch)	215 / 8.46
Total Height(mm / inch)	220 / 9.45
Approx. Weight(Kg / lbs)	51.98 / 114.60

* Weight deviation: ± 5%



Discharge Constant Current (Amperes at 77°F25°C)

End Point	Volts/Cell	10min	15min	30min	45min	2h	3h	5h	10h
1.60V	--	324	195	141	67.1	51.1	33.5	18.0	
1.65V	--	309	187	137	65.3	49.9	32.7	17.9	
1.70V	--	298	183	134	64.1	49.4	32.1	17.7	
1.75V	--	280	178	130	62.6	48.4	31.5	17.6	
1.80V	--	246	169	125	60.3	46.2	31.0	17.5	

Discharge Constant Power (Watts at 77°F25°C)

End Point	Volts/Cell	10min	15min	30min	45min	2h	3h	5h	10h
1.60V	--	584	368	269	125	96.8	64.2	35.4	
1.65V	--	554	347	261	123	95.5	63.1	34.3	
1.70V	--	528	341	254	121	94.2	62.2	33.7	
1.75V	--	511	333	249	115	91.6	61.2	33.1	
1.80V	--	490	327	246	116	89.4	60.2	32.3	

(Note)The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.

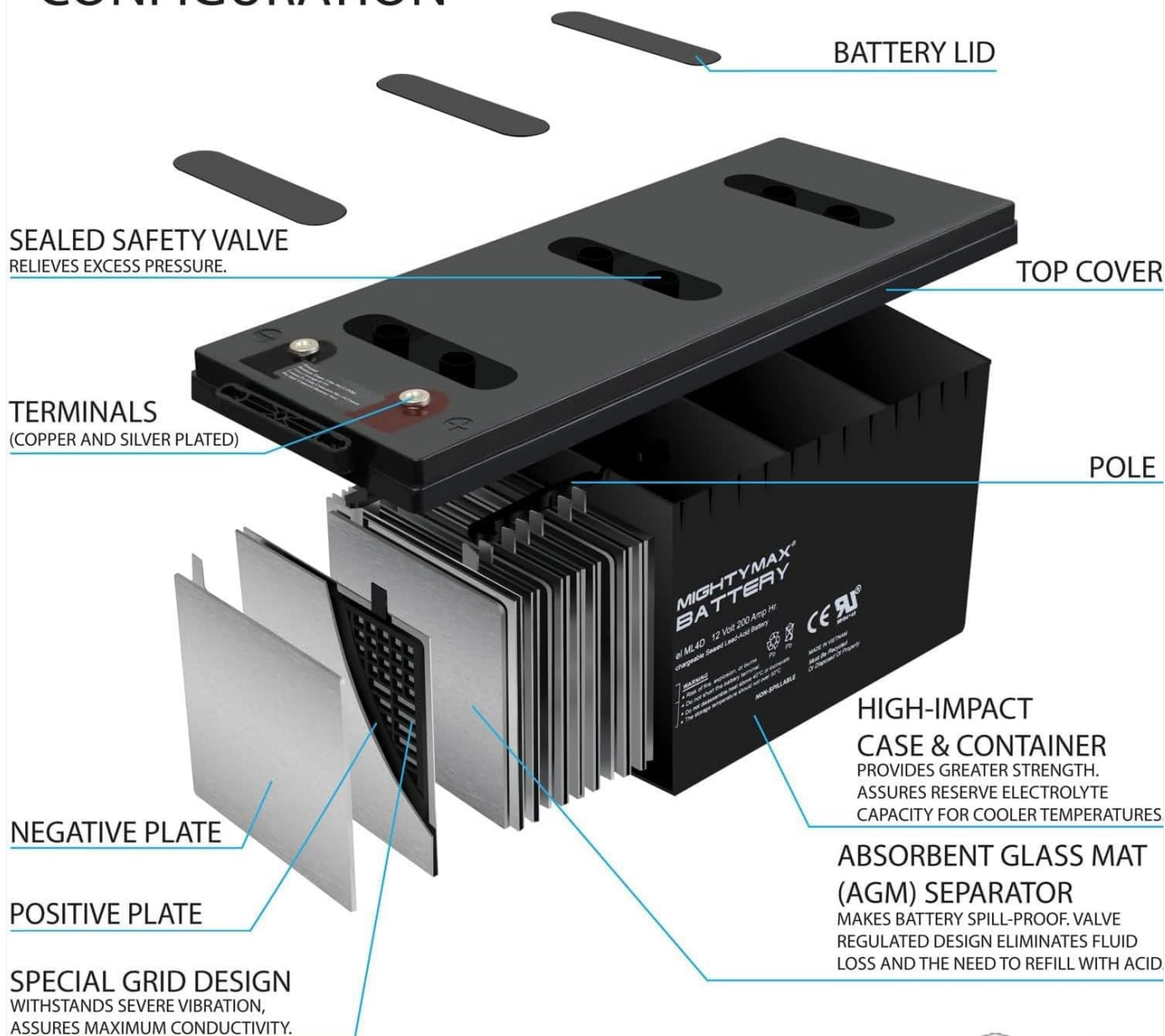
Image 2.1: Warning label on the Mighty Max ML4D4 battery. This label details critical safety precautions including risks of fire, explosion, or burns, terminal shorting, temperature limits, and proper disposal requirements.

3. PRODUCT FEATURES

The ML4D4 battery incorporates advanced design for reliable performance:

- **Battery Type:** 12V 200Ah Sealed Lead Acid (SLA) with Absorbent Glass Mat (AGM) technology.
- **Certification:** UL Certified for safety and quality standards.
- **Maintenance-Free:** Designed for hassle-free operation without the need for electrolyte top-ups.
- **Spill-Proof Design:** Allows for flexible mounting in any position without leakage.
- **Durability:** High-impact case and container provide greater strength and resistance to shocks and vibrations.
- **Performance:** Features a high discharge rate, wide operating temperature range, long service life, and excellent deep discharge recovery capabilities.
- **Terminals:** Copper and silver-plated terminals for optimal conductivity.

CONFIGURATION



This is a model representation of the components within battery.
It is not an actual depiction of said battery.



Image 3.1: Exploded view diagram of the Mighty Max ML4D4 battery. This illustration shows the internal components including terminals, top cover, sealed safety valve, negative plate, positive plate, high-impact case, and the absorbent glass mat (AGM) separator.

4. SETUP

Proper setup is crucial for the battery's performance and longevity.

4.1 Initial Inspection

Upon receiving the battery, inspect it for any signs of physical damage. Ensure the terminals are clean and free from corrosion. The package includes the battery and screws only; no wire harness or mounting accessories are included.

4.2 Mounting

Due to its spill-proof AGM design, the ML4D4 battery can be mounted in any position (vertical, horizontal, or side). However, it is essential to secure the battery firmly to prevent movement, especially given its weight of approximately 114 pounds. Ensure the mounting location provides adequate ventilation, even though the battery is sealed.

4.3 Connections

Connect the battery using appropriate cables and connectors. Ensure the positive (+) terminal of the battery is connected to the positive (+) terminal of your system, and the negative (-) terminal to the negative (-). Incorrect polarity can cause severe damage to the battery and connected equipment. Tighten terminal connections to the recommended torque of 110 in-lbs (12.4 Nm) to ensure good electrical contact and prevent overheating.



Image 4.1: Close-up view of the Mighty Max ML4D4 battery terminals. This image highlights the positive and negative posts, which are designed for secure bolt connections.

4.4 Initial Charge

Although batteries are often shipped with some charge, it is recommended to fully charge the battery before its first use to ensure maximum capacity and lifespan. Refer to the 'Operating Instructions' section for charging parameters.

5. OPERATING INSTRUCTIONS

Follow these guidelines for optimal operation of your ML4D4 battery.

5.1 Charging

Use a charger specifically designed for SLA/AGM batteries. Incorrect charging can significantly reduce battery life.

- **Floating Use (Standby):** For applications where the battery is continuously connected to a charger and provides backup power. The recommended voltage regulation is **13.6V to 13.8V**.
- **Cycle Use (Deep Cycle):** For applications where the battery is regularly discharged and recharged. The recommended voltage regulation is **14.5V to 14.9V**.

- **Initial Current:** The initial charging current should not exceed **60A**.
- **Temperature Compensation:** Charging voltage should be adjusted based on ambient temperature. Refer to the specifications sheet for detailed temperature compensation values (typically $-20\text{mV}/^{\circ}\text{C}$).

5.2 Discharge

Avoid excessively deep discharges, as this can shorten the battery's lifespan. While the battery offers good deep discharge recovery, consistent deep cycling beyond recommended limits will degrade performance over time. Monitor battery voltage during discharge to prevent over-discharge.

5.3 Temperature Considerations

The battery's performance and lifespan are affected by temperature. Operating within the recommended temperature range (typically -20°C to 60°C for discharge, 0°C to 50°C for charge) will ensure optimal results. Extreme temperatures can reduce capacity and accelerate aging.



Image 5.1: Performance graphs for the Mighty Max ML4D4 battery. These charts illustrate constant current discharge, constant power discharge, discharge characteristics, charging voltage, self-discharge rates, life characteristics in standby use, cycle service life, and temperature effects on float life and capacity.

6. MAINTENANCE

The ML4D4 is a maintenance-free battery, meaning it does not require electrolyte top-ups. However, some general care practices will help ensure its longevity.

- **Cleaning:** Periodically inspect and clean the battery terminals to remove any dirt, dust, or corrosion. Use a wire brush and a mixture of baking soda and water if corrosion is present, then rinse with clean water and dry thoroughly.
- **Inspection:** Regularly check the battery casing for any signs of damage, cracks, or swelling. If any damage is

observed, discontinue use and replace the battery.

- **Storage:** If the battery is to be stored for an extended period, ensure it is fully charged. Store it in a cool, dry place, ideally around 20°C (68°F). The battery has a shelf life of approximately six months at 20°C before requiring a refresh charge. Recharge the battery every 3-6 months during storage to prevent irreversible capacity loss.

7. TROUBLESHOOTING

If you encounter issues with your ML4D4 battery, consider the following common troubleshooting steps:

- **Battery Not Holding Charge:**
 - Verify the charger is functioning correctly and providing the correct voltage (13.6-13.8V for float, 14.5-14.9V for cycle use).
 - Check for loose or corroded terminal connections.
 - Ensure the battery is not being over-discharged regularly.
- **Low Voltage Output:**
 - Confirm the battery is fully charged.
 - Inspect cables and connections for damage or looseness.
 - Check the load connected to the battery; it might be drawing too much current.
- **Reduced Capacity:**
 - This can be a sign of aging or consistent deep discharging.
 - Ensure the battery is being charged at the correct voltage and current.
 - Extreme operating temperatures can also lead to reduced capacity.

If these steps do not resolve the issue, please contact Mighty Max Battery customer support for further assistance.

8. SPECIFICATIONS

Detailed technical specifications for the Mighty Max Battery ML4D4:

Specification	Value
Model Number	ML4D4
Voltage	12 Volts
Battery Capacity	200 Amp Hours (Ah)
Battery Cell Composition	Lead Acid (SLA/AGM)
Item Dimensions (L x W x H)	20.87 x 9.45 x 8.74 inches (53.00 x 24.00 x 22.20 cm)
Item Weight	114 Pounds (51.7 kg)
Reusability	Rechargeable
Recommended Uses	Solar Systems, Power Tools, General Purpose

Specification	Value
Floating Use Voltage Regulation	13.6V - 13.8V
Cycle Use Voltage Regulation	14.5V - 14.9V
Max Initial Current	Less than 60A
Design Life	10 years



Image 8.1: Diagram showing the dimensions of the Mighty Max ML4D4 battery. The image provides precise measurements in both inches and centimeters for length (20.87 in / 53.00 cm), width (9.45 in / 24.00 cm), and height (8.74 in / 22.20 cm including terminals).



Image 8.2: Technical specification sheet for the Mighty Max ML4D4 battery. This document provides comprehensive data on battery construction, general features, electrical specifications, dimensions, and discharge performance tables.

9. WARRANTY AND SUPPORT

9.1 Warranty Information

The Mighty Max Battery ML4D4 comes with a **Full One Year Manufacturer's Warranty**. This warranty covers defects in materials and workmanship under normal use and service. Please retain your proof of purchase for warranty claims.

9.2 Customer Support

For technical assistance, warranty claims, or any questions regarding your Mighty Max Battery ML4D4, please contact Mighty Max Battery customer support. Refer to the official Mighty Max Battery website or your purchase documentation for contact details.

10. PRODUCT VIDEO

Your browser does not support the video tag.

Video 10.1: Official product video from Mighty Max Battery. This video provides an overview of Mighty Max Battery products, showcasing their versatility and applications in various systems.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

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After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question