AIMS POWER™

www.aimscorp.net

$LiFePO_4$ Instruction Manual

LFP12V135A
LFP12V300A

12042024

CONTENTS

Lithium $LiFePO_4$ Battery 12V 135Ah

Experience unparalleled quality with AIMS Power's 12 Volt LiFePO4 battery. Designed to maintain a constant output voltage, this battery delivers virtually full power until fully discharged, simplifying or even eliminating the need for voltage regulation circuitry.

Extended Cycle Life: Enjoy a significantly longer cycle life compared to other battery technologies, making maintenance easier and more cost-effective.
Enhanced Safety: Benefit from superior thermal and chemical stability, ensuring safer operation.
Compact and Lightweight: This powerful battery fits seamlessly into the same space as your existing 12V battery, offering a lightweight alternative to lead acid, AGM, or Gel batteries.
Versatile Applications: Ideal for RVs, boats, commercial vehicles, off-grid systems, battery backup power, and more.
Upgrade to AIMS Power's $LiFePO_4$ battery for a reliable, high-performance power solution.

FEATURES

- Extremely high number of charge/discharge cycles
- > 10 Year lifespan with proper maintenance/use
- Built-in heater for charging in cold conditions
- Battery wake-up with a push of a button
- Rotatable digital display
- Bluetooth monitoring
- IP65 rated - water resistant
- Dual position mounting feet
- Stable output voltage
- Smart BMS
- Removable carry handles
- Cell balancing
- 10 Year limited warranty

SAFETY CHARACTERISTICS

- Short circuit protected
- Minor physical damage to battery case will not cause fire Excessive thermal exposure will not cause a fire
- Able to withstand over-charge/over-discharge without damage to battery
- Battery Management System (BMS)

BMS FUNCTION

Circuit Protection: The battery includes a BMS (Battery Management System) to protect the battery from overcharging, over-discharging, over drain, and short circuit, resulting in overall longer battery life. The BMS also protects the battery from exploding and catching fire. Includes thermal safety fusing, cell balancing, CID and fault recovery. Bluetooth monitoring available.

WARNINGS

Lithium-ion cells and battery packs may get hot, explode or ignite and cause serious injury if exposed to extreme conditions. Be sure to follow the safety warnings listed below:

- Do not connect the positive terminal and negative terminal of the battery to each other with any metal object.
- **Only use approved $LiFePO_4$ battery chargers.**
- Do not carry the battery while wearing necklaces, rings, bracelets, hairpins or other metal objects.
- Do not puncture, strike, or step on the battery.
- Do not use LiFePO4 battery with any other types of batteries.
- Do not use as starting battery.
- Do not connect to an alternator or non-smart charging system (unless you are using a voltage regulator).
- Do not smoke around or near the battery.
- Be careful not to drop heavy tools on the battery. Use insulated tools.
- Keep away from children.

Do not place or store the battery in or near fire, on stoves or other high temperature locations. Do not place the battery in direct sunlight or use/store the battery inside cars in hot weather. Doing so may cause the battery to generate heat, explode or ignite. Using the battery in this manner may also result in a loss of performance and a shortened life expectancy and void the warranty.

Do not disassemble or modify the battery. The battery contains safety and protection devices, which if damaged, may cause the battery to generate heat, explode, or ignite.

Immediately discontinue use of the battery if, while using, charging or storing the battery, the battery emits an unusual smell, feels very hot, changes color or shape, or appears abnormal in any way. Contact AIMS Power if any of these situations occur.

Inspect battery for any damage, cracks, corrosion on terminals. DO NOT USE if you find any damage to the battery.

Use good quality and proper size copper cables for your application.

Maximum Battery Wiring Recommendation

Voltage	Series	Parallel	# of Batteries	Max Discharge 135A | 300A	Max Load Power
12V	0	4	4	400A|800A	4.8 | 9.6 kW
24V	2	4	8	400A|800A	9.6 |19.2kW
36V	3	4	12	400A|800A	14.4 | 28.8kW
48V	4	4	16	400A|800A	19.2 | 38.4kW

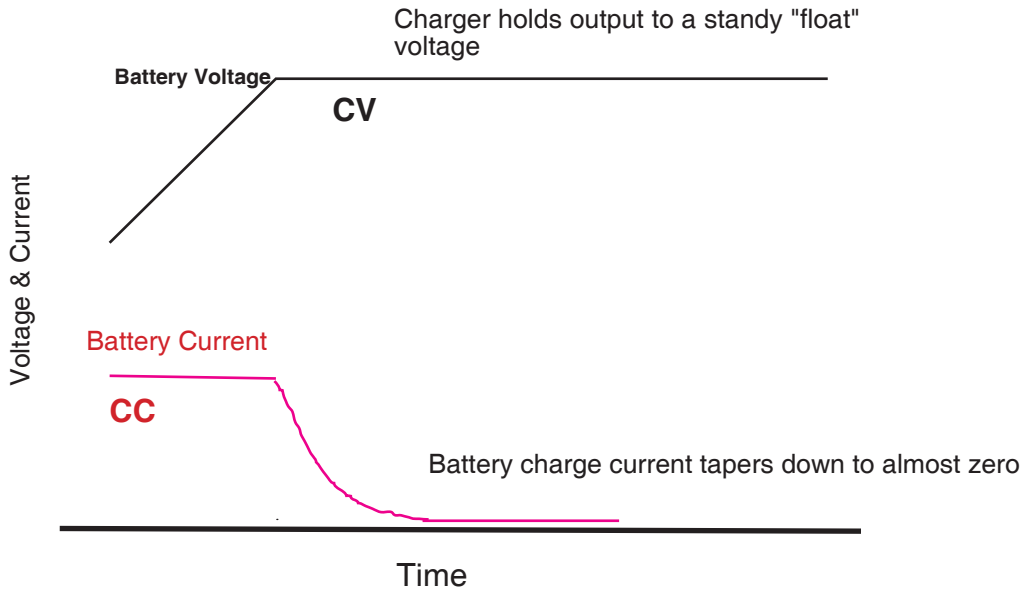
See page 9 for an example of wiring diagram

CHARGING

- Only use battery chargers made for $LiFePO_4$ batteries. See battery specifications. Improper charging can damage the BMS and/or the battery, and will void the warranty.
- Ensure the battery cables are tight, secure, have a good connection and are sized correctly.
- When using multiple batteries, make sure the batteries are fully charged and the SOC of each battery is within 10%. Only use batteries that are the same age and have the same cycle life.
- Chargers that require the detection of voltage at the battery terminals to charge may fail to wake the lithium battery from a state of under-voltage protection. Constant Voltage (CV) chargers may create an inrush of current due to the low impedance of the cells, interrupting the charge. Reset the charger and continue charging normally if the charger trips.
- Constant current (CC) chargers are recommended or the BMS has been triggered.
  To charge a single 12.8V battery, the maximum charge voltage is 14.6V. Any inrush current may trigger over current or short circuit protection.
- Once you reach end-of-charge voltage, apply a constant voltage hold at this voltage until the current displays to almost zero. This charges the cells to 100% state of charge (SOC). Refer to below diagram for an illustration.

CHARGE LIMITS AND TEMPERATURE

Lithium cells cannot accept as much charge current at low temperatures without risking permanent capacity loss. As the cells' temperature rises during charging, they can gradually accept higher currents. When the battery temp is less, the battery will not charge. It will consume 10A of the supplied charge current to activate the heater until temp is over 10 °C | 50°F. The BMS controls charging when temperature is under 0°C / 32°F. To maintain optimum performance and durability of the battery, use the recommended charging found throughout this manual.



Battery voltage and current during recharge

Heating Mode:

When the temperature is below 0°C/32°F and there is an external charger connected, the BMS activates the heating element and turns off the heating function when it reaches 10°C/50°F

Temperature (℃) Max Charge Current	Max Charge Current
-20°C/-4°F	Do not charge
-10°C/14°F	Do not charge
0°C/32°F 0.1C	0.1C
10°C/50°F	Recommended charge current
20°C/68°F	Max continuous charge current
35°C/95°F	Recommended charge current
45°C/113°F 0.2C	0.2C
>55°C/131°F	Do not charge

MAINTAINING THE BATTERY

- Battery should be inspected often.
- Ensure cables are secure and tight. The terminals should be kept clean and free from corrosion, dirt, or build-up of any kind. Use dry cloth to clean.
- When possible keep batteries at a moderate temperature.
- Store battery at 50% SOC and cycle charge every twice a year if store @70°F. If stored in higher temperatures, cycle charge every four months. Do not store in temps below minus 4°F and over 131°F.
- Charge and discharge according to battery specifications.

INSTALLATION

- Do not reverse the polarity! The battery has safety protections, but damage may occur, and void the warranty.
- Check battery voltage before use. Make sure the battery voltage matches that of the battery charger and load. Properly size your battery cables for your application.
- Battery cables must be crimped or preferably, soldered, and crimped. Soldered connections alone are not acceptable. High quality, UL-listed battery cables are recommended.
- Battery terminal must be clean to reduce the resistance between the DC terminal and cable connection.
- Do not connect the positive terminal and negative terminal of the battery to each other with any metal object (such as wire).
- Install in an environment with minimal heat. Warranty voided for terminal burnout due to excess heat and improper maintenance.
- ***Install in any orientation. The battery will not leak or spill.***
- Battery terminal torque – 7.7 – 7.7 Nm
- Use proper fusing.

NOTE: The terminal lugs are in a separate bag within the box.

Switch Off or Wake Up

The on/off push button puts the battery into sleep mode and will turn off the LCD screen. Press the power button for 5 seconds. If there is no charge or discharge for 24 hours, the battery will enter into sleep mode to save energy, any charge or discharge operation will activate the battery.
If the battery was over-discharged, the BMS will enter into sleep mode after 5 min. There is no OCV at this status, only charge operation will activate the battery.
To activate, hold the button for 3 seconds.
NOTE: The rotatable display is included on the 135A LFP12V135A only. The 300A includes a display but it is not rotatable.

*The display can be mounted in different orientations. This can be done under the case lid. 135A only

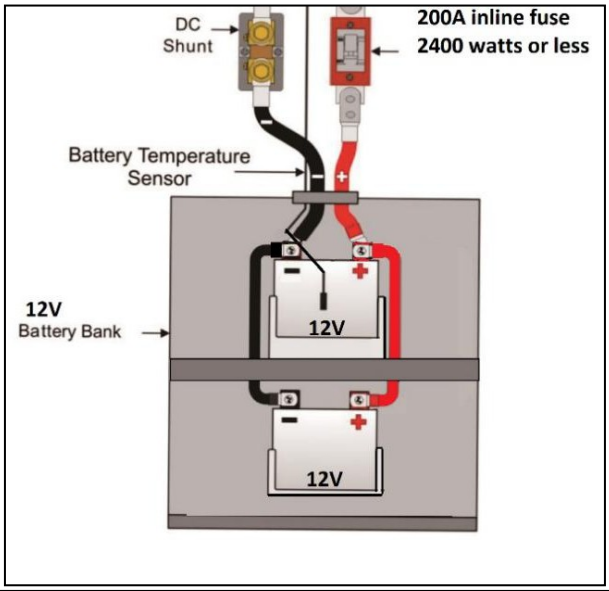
Battery & Accessories

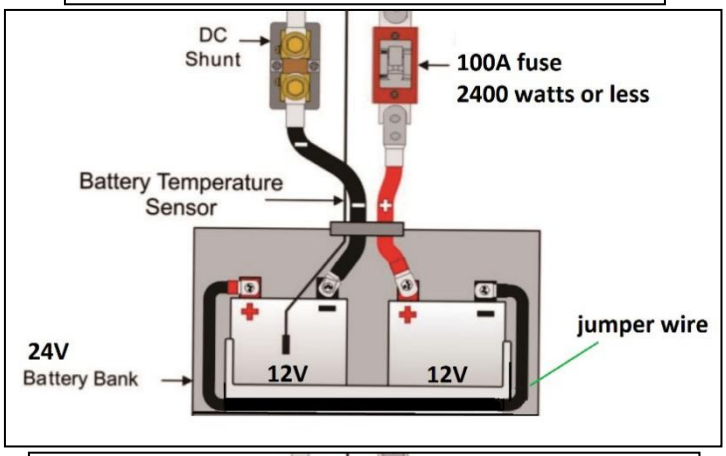
1. CAN Communication Cable，UL2464-24AWG - 1pcs
2. Fixing sheet metal- 4pcs
3. Hexagon socket cross combination bolt M5*10， ROHS - 12pcs
4. Hexagon socket cross combination bolt M8*14，304 Stainless Steel，ROHS -2pcs

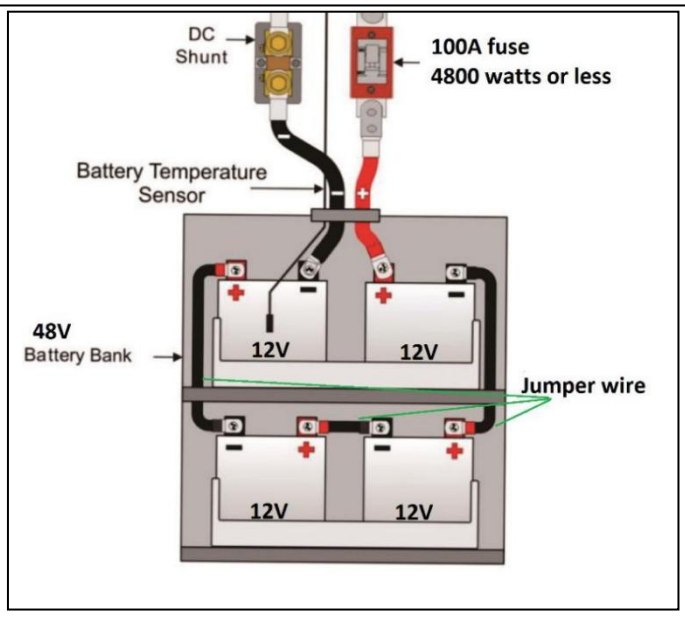
NOTE: The mounting feet are included with the 135A LFP12V135A only.

DC WIRING DIAGRAM ***DC Shunt and inline fuse optional**

NOTE: The fuse and amp sizes in the diagrams may be different for your system. Make sure to properly size your cables and fuses.







BLUETOOTH INSTRUCTIONS

By downloading the Android™ or Apple® app on your smartphone or tablet, you can monitor the following information:

- Battery Voltage
- Battery Current (Amps)
- Battery Charge Status(SOC)
- Charge/Discharge State
- Battery Cycles
- Battery Temperature
- Remaining Capacity (RMC)
- Design Capacity (DCAP)
- Full Charge Capacity (FCC)
- Average Time: Empty/Full

SCAN ME

CONNECTION TO THE BATTERY

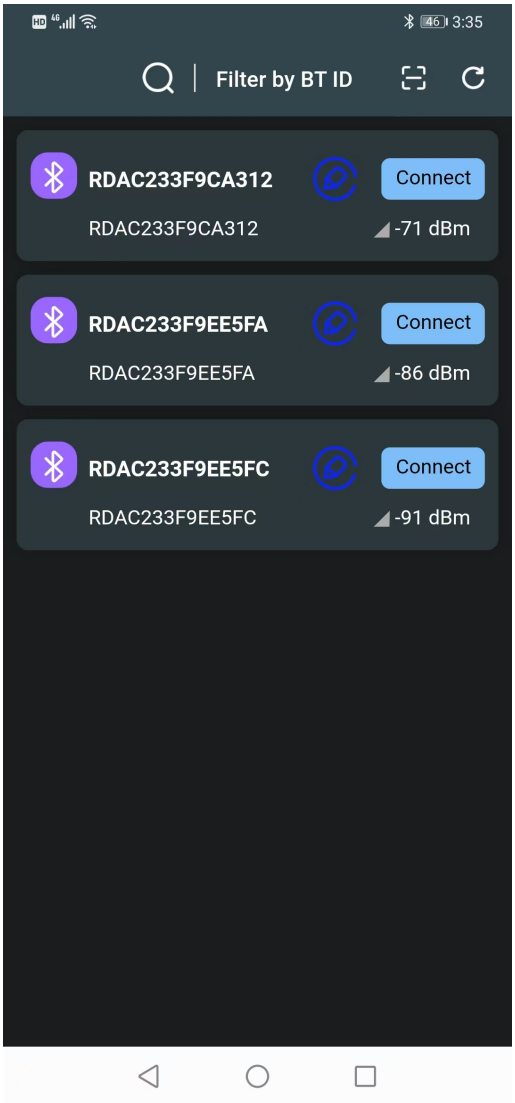
Make sure you have the latest version of **AIMSBATC** APP that can be found on Google Play for Android and the App Store for Apple (IOS). Turn on your Bluetooth. Tap the AIMSBATC icon or use the QR code above.

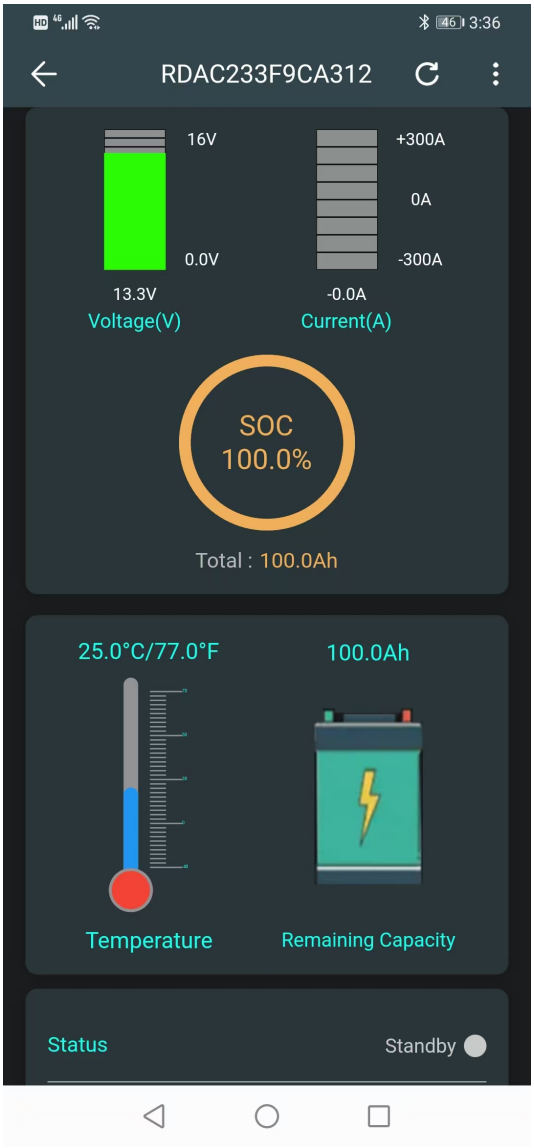
The AIMS' smart batteries within range of your Bluetooth device will appear. If your batteries are not listed, move closer to the battery location and swipe your finger from top to bottom on the APP. This will refresh the screen. Once the battery list is displayed, tap the battery for more information. You can also search the battery's serial number if your battery bank has several batteries. The serial number is located on the battery. Note: The app can only communicate with one battery at a time. You must disconnect from one battery to connect to another one (go back to the battery list screen). Also, if any device (such as cell phone or tablet) is connected to a battery, no other device can connect to that battery until the first device disconnects. If you can't see your battery ID in the Bluetooth APP, the Bluetooth may have fallen asleep to save power when not being used. Apply a 10A charge or discharge to the battery and re-open the APP and search again.

***NOTE:* Screens and data displayed in this manual may change as we continue to make updates to the app as needed.**

BASIC INFORMATION

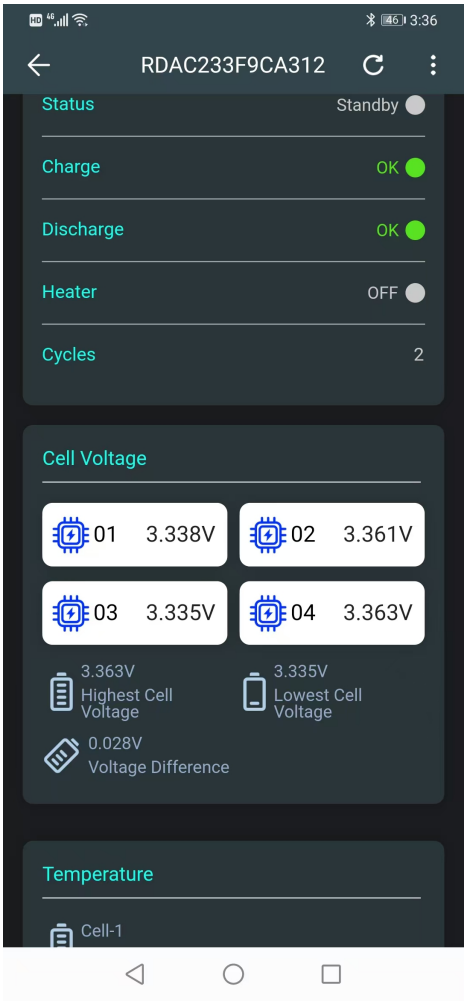
The second screen displays basic information such as, real-time current and voltage. The State of Charge (SOC) circular graph, like a fuel gauge, displays percentage of remaining charge in the battery. At the bottom of the screen, you will find the battery state and number of charge cycles.





DETAILED INFORMATION

The next screens display more detailed information. The thermometer shows current temperature. The battery image displays RMC (Remaining Capacity). You will also find DCAP (Design Capacity), FCC (Full Charge Capacity), Average Time to Empty (ATTE) and Average Time to Full (ATTF), serial # and date.



NOTE:

If the battery has not been connected to the APP or if the battery has been idle > 1 hour, the Bluetooth chip on the BMS may go to sleep or fall out of calibration to prevent parasitic draw on the battery.
You may need to cycle charge or discharge the battery. For the first charge cycle, discharge at least 25A (300 watts) and then recharge. This will wake up the Bluetooth chip and allow the APP to see the battery. A full cycle charge may be needed to recalibrate the SOC.

When connecting multiple batteries in series or parallel, the state of charge for each battery should be within 10% prior to connection. If the state of charge is >10%, each battery will need to be charged, individually.

TROUBLESHOOTING

The 12.8V LiFePO4 batteries are known for their exceptional reliability and extended lifespan compared to traditional 12V lead-acid batteries. However, there may be instances where the battery does not perform as expected. These issues are often due to misuse, abuse, or suboptimal operating or storage conditions. This section outlines potential problems you might encounter with 12.8V LiFePO4 batteries and provides the appropriate troubleshooting procedures.

Charger Trips using Constant Voltage
Problem:
CV charger trips when charging the batteries. This is due to the low impedance of the battery creating a current inrush.
Solution:
Reset the charger and try again.

Terminal Voltage Absent or Low
Problem:
Using a multimeter, the terminal voltage is low (<10V).
Possible causes for this problem are:

1. The voltage of a cell within the battery dropped below 2.5 V, causing the microprocessor to enable low-voltage protection.
2. The battery's SOC dropped below 5% from either an extended idle period or heavy use, enabling under-voltage protection.
3. The battery overheated (>60°C), causing the microprocessor to enable over-temperature protection.

Solution:
To resolve situations where terminal voltage is absent or low:
Connect the AC charging source and power on. Then wake up the battery by holding the wake up button for 3-5 seconds, allowing the remaining battery power to bypass the BMS and show voltage on the DC post for charge to start charging.

Battery Current Disappears when Charging
Problem:
Battery current disappears when charging. Possible causes for this problem are:
The battery overheated, enabling over-temperature protection.
Charger voltage is too high.
Solution:
To resolve situations where current disappears when charging:
1.Allow the battery to cool.
2.Reduce charger voltage to 14.2~.14.6 V.

FAQ

1. How much battery power does the internal heater use?
A: None. The heater is only energized when a charger is applied at low temperatures

2. Why does my battery voltage drop so fast from 12V to less than 11V?
A: LFP batteries operate at a constant voltage compared to lead batteries with most of the energy between 12.5-13.5V.

3. Can I install or mount the battery on its side?
A: You can install in any orientation. The battery will not leak or spill.

4. What APP do I use.
A: AIMSBATC. See page 10.

5. Why can I not see the battery ID in the Bluetooth APP?
A: The battery may be in sleep mode. Please apply a 10A charge or discharge to wake the BT back up. The APP may have timed out and needs to be forced closed, and reopened.

6. Why does Wake Up not work?
A: The battery has been discharged too low and under 7V. Apply a 12V jumper battery to wake the battery up and apply a charging source.

Battery Specifications

Model #	LFP12V135A	LFP12V300A
Electrical Specifications		
Nominal Voltage	12.8V	
Nominal Capacity	135Ah	300Ah
Expected Cycle Life	>3500 cycles w/1C charge and discharge rate, at 77°F, 80% DOD	
Operating Specifications		
Charge Method	Smart charger, constant current, constant voltage	
Charge Voltage Range (Max 14.6V)	14.2 -14.6V	
Continuous Charge Current	100A Max | 50A Continuous	200A Continuous
Charge Temperature	32° F to 113° F (built in heater will kick on in low temps)	
Discharge Current	110A for 15 seconds, 300A for 200mil seconds, 100A continuous	230A for 15 seconds, 300A for 2 seconds, 200A continuous
Discharge Cut-off Voltage	11.2V +/- .5V no power. <10V wake up feature to allow a charge (<7V need to apply a charge)	
High Voltage Cut-off	14.8 +/- .2V	
Discharge Temperature	-4° F to 131° F	
Storage Temperature	-4° F to 131° F	
Self Disharge (stored at 50% SOC)	< 3%/month	
Watt hours	1728 watt hours	3840 watt hours
Physical Specifications		
Battery Dimensions	12.99"L x 6.77"W x 9.6"H |	20.55"L x 9.5"W x 8.65"H
Weight	44 lb	69.5 lb
Shipping Weight	46 lb	71 lb
Group Size	31	8D
Battery post size	5/16" 8m	5/16" 8m
Features		
Cell Balancing	Yes	
Protections	Short circuit, over charge, over discharge, low & high temp, over current, low & high voltage	
Communication CAN/RV-C included on 135A only	CAN / RV-C / Bluetooth	
Heater	Built-in, triggered with charger	
Display	Precise digital SOC | LED indicators (rotatable)	
Mouting bracket	Dual position	
Sleep Mode	Yes - optional	
Cell Certification	UL1973, ROHS, UN38.3	
UPC	840271008783	840271008776
Warranty	10 Yr Manufacturer Defect Prorated – IP65 Rated	
Splashproof	IP65	
Connections	Parallel up to 4 strings & Series 1 string	
Battery Case	ABS+PC, extra strong	

WARRANTY

AIMS Power warrants this battery is free from manufacturing defects for 10 years. If for some improbable circumstance the battery is defective, AIMS will **prorate** the warranty based on use and time with a **pre-authorized return** number and return instructions will be provided. AIMS Power does not warrant batteries that have been poorly maintained, charged incorrectly, reversed polarity, improperly installed, stored and used in excessive heat, physical damage, fire, freeze, water damage, tampered, damage to terminals, failing to keep the correct charge to the battery or use that exceeds rated charge/discharge cycles. DO NOT RETURN BATTERY WITHOUT RMA. IT WILL BE REFUSED. AIMS Power has a team of technicians to provide technical support when needed and will provide directions for all returns. Proof of purchase will be requested. Customer is responsible for shipping fees to AIMS Power. If AIMS Power deems the product defective, AIMS Power will cover the replacement shipping fees.

Contact information for AIMS Power:

Returns Department

9550 Gateway Drive

Reno, NV 89521

775-359-6703

returns@aimscorp.net

www.aimscorp.net

12/31/2024