Volthium

Énergie
Energy

MANUEL UTILISATEUR
BATTERIES 4D & 8D

Our 4D and 8D batteries are designed for use with a maximum of 4-unit series connections. They are ideal for off-grid caravans, recreational vehicles, solar power, boats (servitude) or any application requiring the use of a deep-cycle battery.

They are equipped with a Texas Instrument BMS (Battery Management System) that monitors, optimizes, and protects batteries to ensure safe, precise operation. Note that the 51.2V 100AH battery is equipped with a Microchip Technology BMS.

BMS - General characteristics:

High voltage:

If an individual cell voltage exceeds a prescribed threshold during charging, the BMS will prevent the charging current from continuing. Discharge is still permitted in this condition.

Low voltage:

If an individual cell falls below a prescribed threshold during discharge, the BMS will prevent further discharge. Although the battery is in "low voltage disconnect" mode, it will still allow a charge current.

A battery disconnected at low voltage will have zero volts on the external positive terminal, multiple chargers need to detect a voltage above 10 V to send a charge to the battery.

High temperature: *(+ 55-70° Celsius)

The BMS will not allow a charging or discharging current.

* *Depending on the model, please refer to the technical data sheet for more details*.

Low temperature: (- 20 à 0° Celsius)

The BMS will either prevent charging or use the charging current to heat the cells on self-heating models.

High charging current:

The BMS will not allow a load current that exceeds 100A (+/- 5%) amps for 30s, or 200A (+/- 10%) amps for 0.5s.

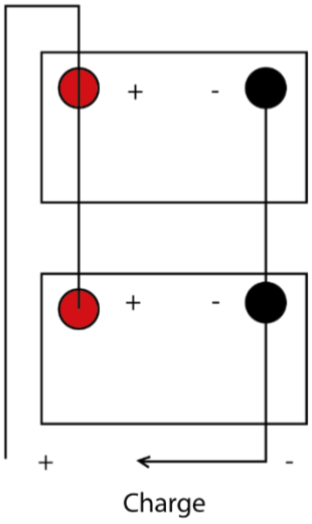
Installation :

Care must be taken when connecting the battery terminals. Positive and negative terminals are labeled and color-coded (red for +, black for -). Do not reverse battery polarity, as this will damage the battery and the connected device.

Parallel

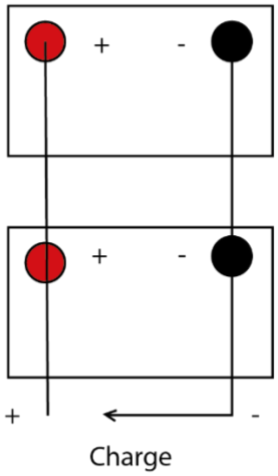
Batteries can be connected in parallel to increase system capacity (please note that if you have more than 2 batteries in parallel, we suggest using a "Busbar". The busbar must be able to accept the continuous current capacity of all the batteries added together). When batteries are connected in parallel, the system voltage does not change, but the amperage will add up. Consequently, all cables and connections must be capable of withstanding the high currents that may be delivered by the batteries. Appropriate fuses and circuit breakers are also required to protect downstream components from current spikes and short circuits. Batteries to be connected in parallel must be in the same state of charge before connection. To avoid excessive discharge currents from one battery to the other, please fully charge each battery using an appropriate LiFePo4 battery charger before connecting them in parallel. Make sure they are in the same state of charge or voltage.

To distribute the current evenly between the batteries, use the diagram below:



TO DO

Equally distributed battery current.
All batteries contribute equally to charging current.



DON'T

Unevenly distributed current.
Batteries closest to the load contribute the most to charging current, while those furthest from the load contribute the least. Wear and tear is higher for batteries close to the load.

Series

Up to 4 12.8V batteries (from the same production series) can be connected in series to increase system voltage to a maximum of 51.2V. When batteries are connected in series, current capacities remain the same, but system voltage will be added. Batteries to be connected in series must be in the same state of charge before connection. Fully charge each battery with a suitable LiFePo4 battery charger before connecting them in series, to ensure they are in the same state of charge.

Battery disconnection

First, disconnect the negative cable from the (-) battery terminal, then disconnect the positive cable from the (-) battery terminal.

Inverter / Chargers

Do not connect batteries to an inverter/charger above 3500Watts without a current surge arrester, as this may damage the BMS and present a potential fire hazard.

Here's an example of how **to** charge the inverter's capacitors using a resistance of 25 ohms / 25 watts to avoid excessive instantaneous discharge when connecting to the inverter for the first time.

Battery charger / solar controller

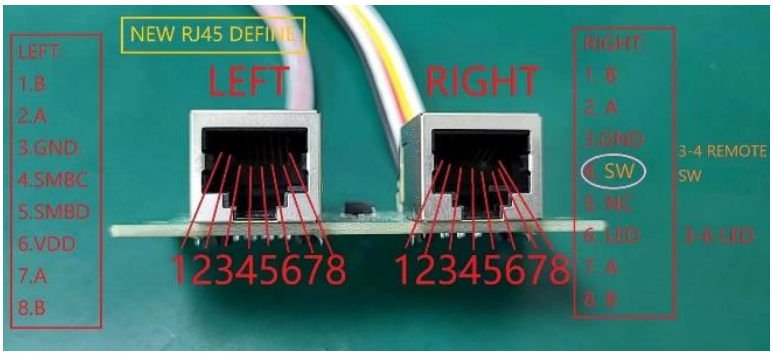
Battery chargers without a specific charging algorithm for lithium (LiFePo4) are compatible. However, if a charger has an automatic equalization mode, this must be deactivated.

SAFETY POINT / WARRANTY CANCELLATION

- DO NOT CONNECT IN SERIES OR PARALLEL WITH OTHER BATTERY TYPES (ACID/LEAD, AGM, GEL OR LITHIUM BATTERIES FROM ANOTHER SERIES)
- DO NOT LEAVE THE BATTERY DISCHARGED (STATE OF CHARGE LESS THAN 5%) FOR TOO LONG
- DO NOT IMMERSE BATTERIES
- DO NOT SHORT-CIRCUIT BATTERIES
- DO NOT REVERSE POLARITY
- DO NOT EXPOSE BATTERIES TO EXCESSIVE HEAT
- DO NOT DROP, DROP, THROW OR APPLY EXCESSIVE FORCE TO BATTERIES
- NOT TO BE USED FOR START-UP APPLICATIONS
- DO NOT DISASSEMBLE, DRILL OR MODIFY THE HOUSING

Communication :

The battery has two RJ45 ports for communication with Volthium-compatible accessories. Both ports offer RS485 communication, so it doesn't matter which port you choose to connect your Volthium accessory to.



Waterproofing:

The battery is fitted with black (or yellow) rubber caps which are essential to maintain the battery's watertight integrity. It's essential to install them correctly to avoid infiltration.

Note that there is a sealant on the inside (epoxy / Silicone) of the connectors to provide a safety barrier, but external protection remains essential and compulsory to maintain the warranty.

If the battery is installed in a damp, condensation-prone environment, or in a place where rain can reach the battery; **apply dielectric sealant around RJ45 ports.**
If you're connecting an RJ45 cable permanently, then fill the port completely with dielectric grease and then plug in the cable. Be generous, it has to overflow.

Dielectric grease is not harmful when injected into the RJ45 connector.

Volthium keeps Permatex dielectric grease in stock.
SKU : ACC-PMT81150

If the battery is to be used in a salty air environment, please also cover the stainless steel switch and apply an even more generous coat to seal the battery.

Switch:

The battery is fitted with a switch that disables discharging, while allowing charging current to enter. When the switch is depressed, the battery can be discharged and recharged for normal use. If the switch is in the non-depressed position, then the voltage on the terminals will be less than 6V, and the battery cannot be discharged, but can still be charged. The self-heating system will also be functional if the switch is in the OFF position.

Heating system and use of the H+ Connector:

Batteries with yellow covers have a small connector called H+. This provides access to the manual heating system for industry professionals only. Only batteries with the self-heating function will have a functional H+ port.

For batteries with the self-heating function, the automatic self-heating system is systematically implemented. It is activated when sufficient current is applied to the battery, and when the battery is below 0 degrees Celsius.

For the manual system, simply connect an energy source to the H+ terminal and close the circuit with the negative terminal, and the internal heating pads will activate. Please note that the manual system is 100% manual, and no thermostat is installed. We strongly recommend that you contact us to speak with a Volthium technician before using the manual heating function.

Charging the battery:

You can recharge your Volthium batteries after each use or when they have been discharged to 20% (state of charge). If the BMS disconnects the battery due to low voltage (0% state of charge), recharge immediately.

Charging with lead-acid battery chargers

Most lead-acid battery chargers (AGM, Gel, FLA) can be used with Volthium batteries as long as they comply with the appropriate voltage guidelines. AGM and FLA algorithms generally match the voltage requirements of our batteries but will not recharge them beyond 90% to 95%. To recharge to 100%, we recommend replacing your charger with a lithium-function charger. As the BMS protects the battery, the use of lead-acid chargers will generally not damage the battery. However, the charger must be disconnected once the battery is fully charged. Do not leave the charger in place to hold or store the battery.

Battery charging parameters

Please refer to your battery data sheet for charging instructions.

Series or parallel connection

When connecting batteries in series or parallel, make sure That the voltage difference between one battery and another does not exceed 0.1 V. We recommend fully charging individual batteries once a year to avoid imbalance. When charging Volthium batteries in series, it's best to use a multi-bank charger that charges each battery individually to ensure that cells remain balanced.

Charger/inverter and charge controller

Charge specs for the 12.8V batteries	Voltage specs for the 12.8V batteries
Bulk Voltage : 14.2V-14.6V	Low Voltage Cutoff 11V-11.5V
Absorption Voltage : 14.2V-14.6V	High Voltage Cutoff 14.6V
Absorption Time : 0-30min	
Float Voltage : 13.3 -13.6V	

Volthium batteries do not require equalization.

Charge specs for the 25.6V batteries	Voltage specs for the 25.6V batteries
Bulk Voltage : 28.8 – 29.2V	Low Voltage Cutoff 20V
Absorption Voltage : 28.8 – 29.2V	High Voltage Cutoff 30.8V
Absorption Time : 0-30min	
Float Voltage : 27.2 V	

Charging with a vehicle alternator

To protect your battery and alternator, we strongly recommend adding a DC-to-DC voltage regulator between the alternator and the battery(ies).

Storage

Before storing your batteries, charge them to between 70% and 80% and then disconnect them from any charging or discharging. It is not necessary or recommended to connect the battery to a trickle charger.

Warning:

- Never exceed 60V on a series connection
- Do not use deep-cycle batteries to start engines
- Always use a protective device when an alternator is in the electrical circuit (DC-to-DC)
- Never store the battery when it is flat
- Be sure to precharge the circuit capacitors before connecting the lithium battery (unless the battery includes the Soft-Start feature, available on certain Volthium products)
- Cycle batteries thoroughly at least twice a year to keep cells balanced and healthy

Bluetooth and self-heating functionalities

Adding the Bluetooth function

WARNING! To get the bluetooth function you need to add a Bluetooth dongle to your battery (not included). Download the application « Volthium Monitor » for Android or « Volthium Monitor » for iOS.

When you open the mobile application, you'll come to the battery scan menu. There's no need to go into your mobile device's settings to establish a Bluetooth connection. No pairing button needs to be pressed to pair your battery with your mobile device. The application will detect your battery within a radius of less than 6 meters.

The data provided in the application will be accurate once the battery has been fully charged with a compatible charger.

When the battery is in standby mode, the voltage data on the battery terminals and on the application may differ by up to 0.7 V. Once in charge or discharge mode, the data will be identical. The voltage on the application is always the most accurate, as it is taken directly from the cell block.

**** You will find valuable additional information on Bluetooth functionality in the FAQ section ****

Self-heating function

Batteries incorporating a self-heating system will only activate when the battery is being recharged and when the internal temperature of the cells falls below zero. So, when the battery is connected to a charger or other energy source, the BMS will first use charging current to build up an internal heat of 11 degrees and then start charging the battery. The power source must be at least 5A for the self-heating system to start. Your Aventura will be able to go from -20 degrees to 11 degrees in just 2 hours.

10-year Limited warranty:

Volthium Energy warrants that each Aventura Series LiFePo4 battery sold by Volthium Energy or one of its authorized distributors or resellers is free from defects in performance for a period of 10 years from the date of sale as determined by the customer's sales receipt, shipping invoice and/or battery serial number, with proof of purchase.

Subject to the exclusions listed below, the manufacturer will repair if repairable, replace or credit, the product and/or parts of the product, if the components in question are found to be defective.

During the first 4 years of the life of your Volthium Battery, if applicable under this Limited Warranty, the amount covered for a new replacement battery will be 100%. From the first day of the 5th year of life of your Volthium battery, if applicable under this limited warranty, the amount covered for a new replacement battery will be determined according to the table below:

Number of years of defective Volthium battery life under this limited warranty	% of the amount covered for the equivalent Volthium replacement battery included in this limited warranty
5th year	60%
6th year	50%
7th year	40%
8th year	30%
9th year	20%
10th year	15%

*** The amounts granted above are always conditional on the return of the defective battery to Volthium with proof of purchase. ***

Declaration of warranty

This warranty is the only legitimate warranty carried by Volthium Energy. In no event shall the manufacturer be liable for any direct, indirect, or consequential loss or damage of any nature whatsoever in connection with Volthium brand batteries.

This warranty is understood to be the exclusive agreement between the parties concerning the subject matter hereof. No employee or representative of the manufacturer is authorized to make any warranty in addition to those set forth in this agreement.

Non-transferable warranty

This limited warranty is to the original purchaser of the product and is not transferable to any other person or entity. Please contact the place of purchase for all warranty claims.

Warranty exclusions

The manufacturer has no obligation under this limited warranty for products subject to the following conditions (including, but not limited to):

- Damage due to incorrect installation; loose terminal connections, undersized wiring, incorrect connections (series and parallel) for desired voltage and AH requirements, or connections with reversed polarity;
- Environmental damage; inappropriate storage conditions as defined by the manufacturer; exposure to extremely hot or cold temperatures, fire or frost, or water damage;
- Collision damage;
- Damage due to improper maintenance; under or overloading the product, overloading when cold, use of an unsuitable charger, etc;
- Product that has been opened, pierced, modified or altered;
- Product used for applications other than those for which it was designed and intended, including repeated engine starting;
- Product used on an oversized inverter/charger without the use of a manufacturer-approved surge suppressor;
- Product not stored in accordance with manufacturer's storage instructions, including low-load storage;
- Product that was undersized for use, including an air conditioner or similar appliance with locked rotor starting current that is not used in conjunction with a manufacturer-approved surge-limiting device;
- This limited warranty does not cover a product that has reached the end of its normal life due to excessive use. A battery can only deliver a fixed amount of energy over its lifetime, which will occur over different periods depending on usage. For example, repeated and frequent use of more than one battery cycle per day will result in normal end-of-life before the end of the warranty period. The manufacturer reserves the right to refuse a warranty claim if, upon inspection, it is determined that the product has reached the end of its normal life, even though it remains within its warranty period;
- This limited warranty does not apply to non-essential battery components. These are covered as follows:
  LCD SCREEN – 1 year;
  Bluetooth device – 4 year.

Repairs without warranty

For any damage outside the warranty period, or for damage not covered by the warranty, customers can always contact the manufacturer for battery repairs. Costs will be assessed and determined according to the current terms and conditions.

Submitting a warranty claim

To submit a warranty claim, please contact Volthium Energy by email at support@volthium.com or call us at 514 989-9586.

Return and refund policy

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If you're not completely satisfied with your purchase, we're here to help.

Return

You have 14 calendar days to return an item from the date of shipment. To be eligible for a return, your item must be brand new (sealed box) and unused. Keep the original packaging for 45 days. Your item must be in its original packaging. Your item must have the receipt or proof of purchase. No returns will be accepted without a secure barcode label number.

Refund

Once we have received your item, we will inspect it and inform you that we have received your returned item. We will proceed with the refund immediately after inspecting the item and confirming its eligibility.

Shipping

You will be responsible for paying your own shipping costs for the return of your item. Shipping charges are non-refundable. If you receive a refund, the return shipping costs will be deducted from your refund.

If you have any questions about how to return your item, please contact us.

Return request

To submit a return request, please contact Volthium Energy by email at support@volthium.com or call us at 514 989-9586.