12 V 560 Ah
USER MANUAL

Volthium Energy inc. | T. 514.989.9586 | info@volthium.com | www.volthium.com

SUMMARY

1. Safety

1.1 Statement

Please read this manual carefully before installation, operation, and maintenance, and pay attention to various warning signs and statements on the equipment. After reading this manual, please keep it properly for future reference.

1.2 Specification

These manual contents using the following symbols should be paid special attention to during operation.

Symbol	Statement
ATTENTION	Attention: Reminder of precautions during operation.
WARNING	Warning: Indicates that there is a hazardous situation during the operation process and special attention needs to be paid.

1.3 Critical safety info

Before installing, operating, or maintaining the battery, the following operating and maintenance instructions must be read.

Before installing :
- It is very important and necessary to carefully read the user manual before installing or using the battery. Failure to follow any instructions or warnings in this document may result in electric shock, serious injury, or damage to the battery and the entire system.
- Before connecting the battery pack to your device, check the voltage and ensure that they are within the limits of your device specifications. Failure to comply with these specifications will void your warranty.

During installation :
- Personnel familiar with the electrical specifications of their country or region are required to install battery packs. For optimal safety, please follow the steps described in this manual. The environmental conditions specified in the product specification must be followed.

ATTENTION

- Prohibit connecting batteries to different types of batteries;
- Do not use faulty or mismatched chargers to charge the battery;
- Long term float charging is prohibited for lithium-ion batteries;
- The environmental conditions given in the product documentation must be followed;
- If the battery is found to be deformed, abnormally hot, or emitting an odor, please immediately cut off the power and stop using it.

1.4 Battery maintaining

1. Professional personnel should take care of the charging operation, ensure good contact between the plug and socket during the charging process, ensure normal operation of the charging equipment, and ensure good contact at all connection points of the battery pack. If there is an abnormality, it needs to be repaired before charging;

2. If there is a large amount of dust, metal shavings, or other debris on the upper cover and pole of the battery pack, clean it with compressed air in a timely manner to avoid using water or objects soaked in water for cleaning;
3. Try to avoid splashing water or other conductive objects onto the battery cover and pole during charging and discharging, such as when exposed to heavy rain for use;
4. Estimate the charging and discharging time of the battery or battery pack based on its actual usage status. Pay attention to observing whether there are any abnormalities in the battery or battery pack at the end of charging and discharging, such as voltage difference issues;
5. Check whether the conductive strip, voltage collection terminal, and other nodes are loose, detached, rusted, or deformed, ensuring that the battery pack is used in series or parallel reliable fixation (once/3 months).

1.5 Waste treatment

ATTENTION

Please dispose of the packaging and replaced parts in accordance with the regulations applicable in the country where the device is installed. Do not dispose of the battery with normal household waste.

2. Installation

2.1 Tools and Equipment

Insulating Gloves

Safety Shoes

Tools

2.2 Battery placement

Gently place the battery pack face up on the support surface, do not lay it on its side or upside down, and do not place any covers above the pack. The schematic diagram of battery pack placement is shown in figure.

2.3 Battery supporting materials

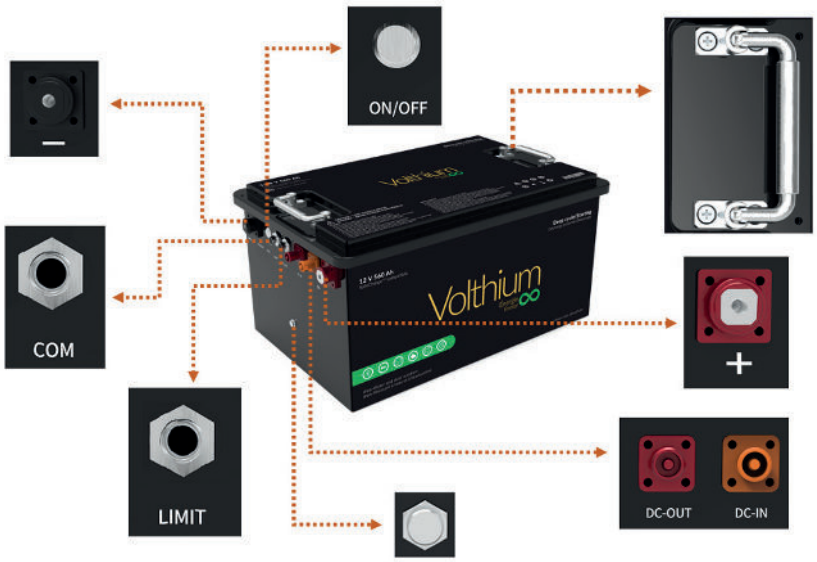
NO.	Material name	Chart	QTY (PcS)	SPEC
1	Battery		1	12.8 V 560 Ah
2	Bracket		4	Installation bracket
3	Screw		8	M8 * 16 mm stainless steel screws
4	Screw		2	M8 * 20 mm stainless steel screws

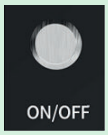
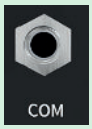
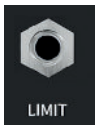
3. Introduction to Volthium series batteries

3.1 Main features

a. LiFePO4 composition - providing excellent safety and lifespan
b. High reliability
c. Maintain consistent performance over a wide temperature range
d. With higher heat dissipation effect, it can maintain high current charging and discharging of the battery for a longer time
e. The communication function enables the battery to communicate with external devices through CAN, enabling better battery management.

3.2 Product appearance



Component description			
NO.	Component appearance	Name	Statement
1		Power switch	To power On/Off the battery
2		Power terminals	Black negative M8 terminal Red positive M8 terminal
3		Communication port	Communication with external inverter
4		80 A current regulator presence detection port	Connection for detecting 80 A current regulator installation
5		Pressure relief valve	To prevent lithium batteries from exploding in special circumstances
6		80 A current regulator interface ports	DC-IN Port - Connects to the DC input of the 80 A current regulator for power supply input. DC-OUT Port - Connects to the DC output of the 80 A current regulator, delivering current limited to a maximum of 80 A.
7		Handle	Convenient handling of batteries

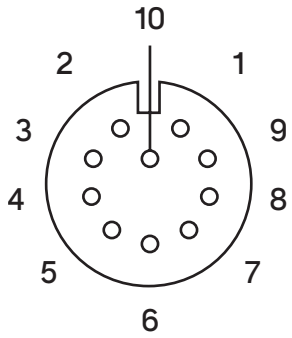
1. Power Switch

The battery power ON/OFF switch is used to turn the battery on or off. When the battery is in the ON state, it can be charged, discharged, and connected to Bluetooth.
When the battery is in the OFF state, it is shut down and cannot be charged or discharged, and cannot connect to Bluetooth. When the battery is not used for a long period, please place the switch in the OFF state to reduce power consumption.
The lithium battery is equipped with an intelligent BMS (Battery Management System), designed to better protect the battery. When switching from the OFF state to the ON state, the BMS performs a self-check, which takes no more than 10 seconds. Therefore, the startup time is within 10 seconds.

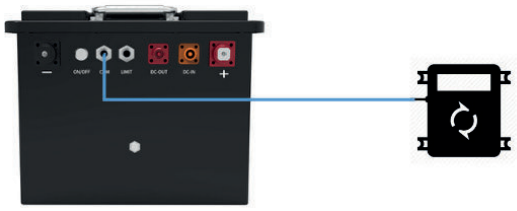
2. Power Terminals

Each battery has a positive terminal and a negative terminal. During use, ensure correct identification and avoid reversing polarity. After connecting the power cable to the terminal, cover it with a protective cap to prevent short circuits.

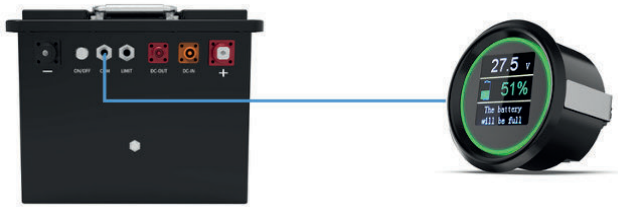
3. Communication port

Top View	Pin	COM	Usage
	1	D1	Short D1 and D2 to release reversed capacity
	2	D2	
	3	CANH	Communication with external inverter/gauge
	4	CANL	
	5	/	
	6	/	
	7	/	
	8	S1	OFF (Deep sleep/emergency) : Short S1 and S2 ON (Exit) : Disconnect S1 and S2
	9	S2	
	10	/	

When the battery needs to communicate with inverter, COM port needs to be connected;



The battery is equipped with a Gauge (sold separately), which connects to the battery via a COM port.



4. 80A Current Regulator Presence Detection Port

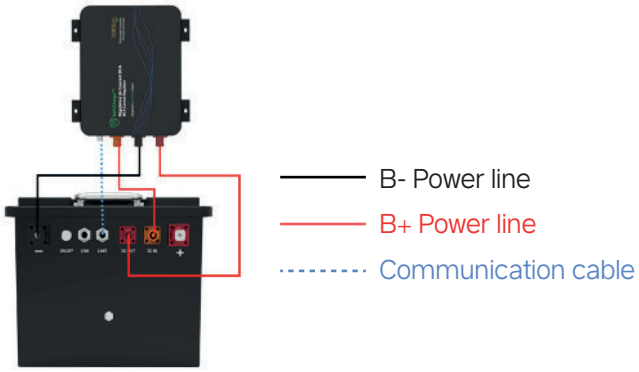
The battery is equipped with an 80 A current limiter (sold separately). This port is the presence detection interface for the 80 A current limiter, used to detect whether the limiter is connected.

5. Pressure relief valve

The waterproof grade is IP66, because the battery will generates heat during charging and discharging, which leads to thermal expansion. Adding a pressure relief valve can prevent the air pressure inside the battery box from rising, resulting in dangerous accidents. Make sure that there is no other object around the relief valve.

6. 80 A Current Regulator Interface Ports

The battery is equipped with an 80 A current limiter (sold separately). The DC-IN and DC-OUT ports are used to connect to the DC-IN and DC-OUT ports of the 80 A current limiter, respectively. The 80 A current limiter can restrict the high charging current from the alternator to around 80 A, which helps prevent the fuse between the battery and the alternator from burning out. The wiring diagram as follow:



7. Handle

The handle is used for bearing the weight of the battery. When lifting the battery, pay attention to observing the stability of the handle to avoid the battery falling off.

3.3 Battery Performance

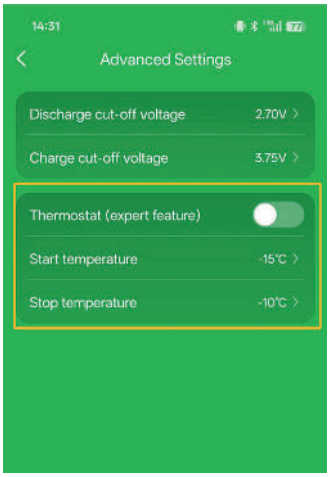
3.3.1 Parameters

Item	12 V 560 Ah
Nominal voltage	12.8 V
Nominal energy	7168 Wh
Nominal capacity	560 Ah
Internal resistance @ 1 khz AC	≤10 mΩ
Allowed MAX. charge current @ 25 °C	300 A
Allowed MIN. discharge current @ 25 °C	300 A
Recommend charge current	150 A
Recommend discharge current	150 A
Peal /Surge current limit	1500 A @ 10 s
Short circuit current	2000 A @ 500 µs

3.3.2 First use

1. Observe that there are no signs of the battery being removed.
2. When the battery leaves the factory, the power button will be turned off.
3. Before using the battery, it is necessary to turn on the power button.

3.3.3 Heating Function



1. Charger heating

The battery features a low-temperature heating system. In cold weather conditions, the built-in heater will automatically activate when a charger is connected. The system first raises the battery temperature above 10°C before initiating the charging process.

2. Auto-heating

This battery is equipped with an automatic heating function. When no external charger is available, it can power the heating film through self-discharge from the battery cells. The heating film is tightly attached to the cells, thereby raising their temperature. This function can be configured via the Volthium Pro Series APP, allowing the user to set the start and stop temperatures to maintain the battery cell temperature within the specified range.

3.3.4 Remote On/Off

The battery can enter OFF (deep sleep mode) state via connecting S1 and S2 (pins on the LINK IN communication port, please refer to chapter 3.2 point 3) for all the time when the battery not be used for a long time, which can reduce the consumption. It takes around 15s to enter OFF state. Disconnecting S1 and S2 will exit the OFF state, turn to ON state and then the battery can be use as normal.

3.3.5 Active balancing

The BMS features active cell balancing to optimize performance and lifespan by automatically redistributing energy between cells, ensuring voltage uniformity and preventing overstress. This improves capacity utilization, enhances safety, and extends battery life with minimal energy loss.

4. Parallel connection of batteries

4.1 Introduction

The 12 V 560 Ah battery supports parallel connection of up to 16 units to increase system capacity. Series connection is prohibited.

ATTENTION

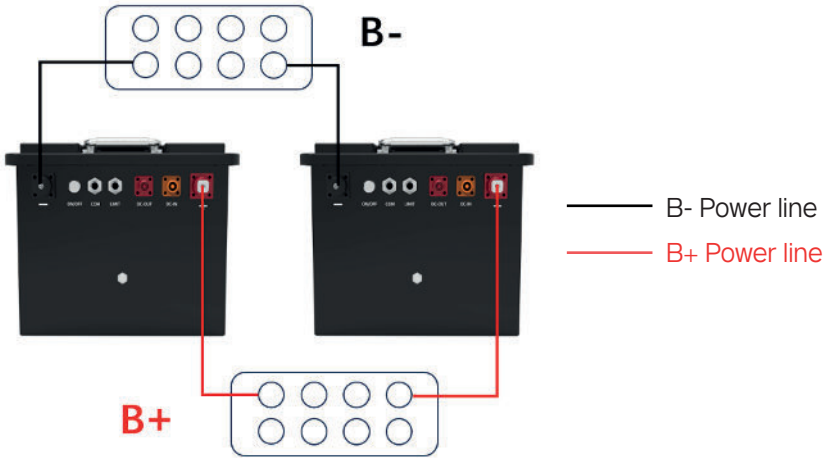
Before connecting batteries in parallel, it is necessary to pay attention to :

a. The batteries must be the same model ! Different models, different capacities and different voltage platforms is not allowed to be connected in parallel;
b. Ensure that all parallel wires have the same length;
c. We recommend 0.5 C for charging, that is, charging current=Nameplate capacity of battery * 0.5 C
d. Before connecting the batteries in parallel, the voltage of each group of batteries must remain highly consistent. It is recommended that the voltage between batteries packs be:＜200 mV (@ 96 % ~ 100 % SOC). After the batteries pack are connected in parallel, it will be charged and discharged as a whole system.

4.2 Parallel usage

When batteries are in parallel, a maximum of 16 batteries can be used. Before parallel connection, The voltage between each battery's positive and negative terminals must be verified using either a multimeter or the Bluetooth app, ensuring the voltage difference between any batteries does not exceed 200 mV. If the voltage difference exceeds 200 mV, each battery must be fully charged individually, left to rest for one hour, and then rechecked for voltage compliance before being connected in parallel. Always confirm all batteries meet the 200 mV maximum voltage difference requirement prior to parallel connection to ensure safe operation.

For example, two 12.8 V 560 Ah batteries connected in parallel
System voltage：12.8 V System capacity：560 Ah*2 = 1120 Ah



4.3 Battery communication

4.3.1 Battery Communication Networking Function

The 12 V 560 Ah battery feature a communication function that enables data exchange between battery and external devices (such as Victron inverter or Gauge). This function allows the system to summarize battery information for improved monitoring and control. The battery can operate independently or as part of a networked system, making them ideal for smart energy applications. Each battery is equipped with a Controller Area Network (CAN) bus interface called COM port which is M12-10pin. When not in use, protective black covers should remain installed on the connector to prevent environmental damage. The CAN bus is not required for basic battery operation the system will function normally without communication networking. For additional technical support, contact Volthium's engineering team.

5. Charging requirements

We recommend using a charging source with specific lithium charging settings to meet the following charging requirements to achieve the optimal performance and lifespan of Volthium series batteries.

Model	Max charge voltage	Cut-off voltage	Maximum charge current	Recommended charge current	Operation temperature
12 V 560 Ah	14.4 V	11.2 V	1 C	0.3 C	Charge : -20 - 60 (with heater) Discharge : -20 ~ 60 °C
Note: Batteries with heating function need to be heated before switching to charging mode.					

5.1 AC-DC charger

Check if the AC-DC battery charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. Many battery chargers are only designed to charge Lead–acid battery and may not have appropriate lithium charging settings.

5.2 Photovoltaic charging

Check if the solar regulator you plan to use has a dedicated lithium charging setting that meets the above charging requirements. The Volthium series batteries can be charged using a solar regulator without lithium charging settings. However, it must be set to charge no 14.6 V for a single battery. After the battery is fully charged, do not open the solar regulator without a suitable lithium charging setting.

5.3 Charging with an AC generator through a DC-DC charger

Check if the DC-DC charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. You can use a DC-DC charger without lithium charging settings to charge Volthium series batteries. However, it must be set to charge no more than 14.6 V for a single battery, and then it must be turned off after the Volthium series battery is fully charged. After the battery is fully charged, do not turn on the DC-DC charger without a suitable lithium charging setting.

5.4 Recommended charging voltage

We strongly recommend a dedicated charger for lithium-ion batteries to better fully charge the battery. At the same time, according to the actual situation, AGM chargers can also be used to charge the battery, which can achieve varying degrees of effect.

6. Battery recycling

Volthium 12 V 560 Ah batteries are recyclable and should not be treated as household waste or landfill waste. If you need assistance in recycling batteries, please contact your dealer or Volthium's technical support engineer (as mentioned earlier in this manual).

7. Transportation and Storage

ATTENTION

- During transportation, there should be no severe vibration, impact, or compression, and it should be protected from sunlight and rain.
- Handle with care during loading and unloading, and strictly prevent falling, rolling, and heavy pressure.
- The battery should be stored in a dry, clean, dark and well ventilated indoor environment for a long time. The recommended storage temperature range is 15~35 °C.
- The storage area is free of harmful gases, flammable and explosive materials, and corrosive chemicals.
- Batteries should be stored and transported at temperatures close to 50% SOC.
- If not used for a long time, the battery needs to be charged every 6 months according to the specifications.
- It is strictly prohibited to collapse, and the stacking should not exceed 6 layers, with the surface facing upwards.

8. Warnings and Attentions

Please carefully read the battery specifications or instructions before use. Improper use may cause the battery to heat up, catch fire, rupture, damage, or decrease capacity. Energie Volthium Inc shall not be responsible for any accidents caused by not following our operating instructions.

WARNING

- The battery must be kept away from heat sources, high voltage, and directly exposed to sunlight.
- Do not throw the battery into water or fire.
- Do not invert the two terminals when using the battery.
- Do not connect the positive and negative poles of the battery to the conductors.
- Do not strike, throw, or step on the battery.
- Do not disassemble the battery without the manufacturer's permission and guidance.
- Do not mix batteries of different capacities and brands.

ATTENTION

- It is recommended to fully charge the battery every month to correct the battery SOC.
- When the battery is discharged, please charge the battery in a timely manner (≤ 2 days).
- Please use a dedicated lithium battery charger to charge the battery.
- Please stop using the battery when it emits odor, heat, deformation, or any abnormalities occur.
- Please place the battery away from children or pets.
- If the battery pack electrolyte leaks, please avoid contact with liquids or leaked gases. If the battery pack electrolyte leaks, please take the following steps immediately.
- Inhalation of gas: Evacuate personnel from the contaminated area and seek medical attention as soon as possible.
- Eye contact: Rinse eyes with water for 15 minutes and seek medical attention as soon as possible.
- Skin contact: Thoroughly rinse the exposed area with soap and water to ensure there are no chemicals or soap residues on it, and seek medical assistance as soon as possible.
- Swallowing: Try to induce vomiting and seek medical attention as soon as possible.
- Fire: Please use carbon dioxide fire extinguishers instead of liquid fire extinguishers to extinguish the fire.