Lithium Battery

User Manual

48V 100Ah Rack Mounted Lithium Battery

About 48V 100Ah Rack Mounted Lithium Battery

The 48V 100Ah Rack Mounted Lithium Battery can be installed in Parallel mode, more attention should be paid for the DIP and address selection following with part 5.2.2.

About This Manual

This manual is intended for the 48V 100Ah Rack Mounted Lithium Battery, but the hybrid inverter and any other equipment is not included.

Declaration

We declare that this 48V 100Ah Rack Mounted Lithium Battery is compliance with the essential requirements.

Contents

1. Safety Introduction

1.1 Important Safety Instructions

This manual contains important instructions for:

48V 100Ah Rack Mounted Lithium Battery energy storage product

And this manual must be followed when installing and using this product.

The product is designed and tested in accordance with international safety requirements IEC 60364, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

1.2 Warnings in This Document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the equipment and/or other equipment connected to the equipment or personal injury.

Symbol	Description
	Caution, risk of electric shock
	Heavy enough may cause severe injure
	Keep the battery away from open flame or ignition sources
	Keep the battery away from children
	Do not dispose of the product with household waste
	Recycling
	Read this manual before installation and operation

For safety reasons, installers are responsible for familiarizing themselves with the contents of this manual and all warnings before performing installation.

1.3 Battery Handing Guide

- Use the battery pack only as directed.
- If the battery defective, appears cracked, broken or otherwise damaged, or fails to operate, contract the distributor immediately.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery. The battery pack is not user serviceable.

- To protect the battery and its components from damage when transporting, handle with care.
- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.

1.4 Response to Emergency Situations

The 48V 100Ah Rack Mounted Lithium Battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, we cannot guarantee their absolute safety for uncertain situations.

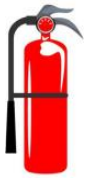
1.4.1 Leaking batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area, and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.



Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.4.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby and does not use water to extinguish the fire.

WARNING

The battery pack may catch fire when heated above 130°C.
If a fire breaks out where the battery is installed, do these actions:
1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.4.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. Contact your distributor for technical assistance.

1.4.4 Damaged battery

If the battery damaged, please contact your distributor for help as soon as possible, because damaged battery is dangerous and must be handled with extreme caution. Damaged battery is not suit for use and may pose a danger to people or property. If the battery seems to be damaged, return it to your distributor.

CAUTION

Damaged battery might export electrolyte or flammable gas, so contact for advice and information immediately we will deal with it within 48h.

1.5 Installers

The 48V 100Ah Rack Mounted Lithium Battery is suggested installing by skilled worker or electrician. A skilled worker is defined as a people who had been trained and qualified electrician or had all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Energy Storage systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

1.6 Scrap Battery

For scrap battery(-ies), please treat with local laws or regulations to recycle or scrap.

2. Product Introduction

2.1 Technical Data

Model	**48V100Ah Rack Mounted Battery AP-S-48100**
Battery Type	48V 100AH LiFeP04
Nominal Energy (KWh)	4.8
Usable Energy (KWh)	4.32
Peak Output Power (KW, 3 Seconds)	7.68
Round-Trip Efficiency	≥97.5%
Nominal Voltage(V)	48V
Operating Voltage(V)	42-54.5
Max Charge/Discharge Current(A)	80/80
Communication	CAN, RS485
Enclosure Protection Rating	IP21
Operating Temperature (°C)	-20 - 55
Cooling Type	Natural Cooling
Installation	Rack Mounted, Free Stand, Indoor
Cycles Life	＞6,000
Design Life	20+ Years (25℃@77℉)
Recommend DOD	90%
Dimension (W*H*D, mm)	442*133*550
Weight (Kg)	41
Humidity	5% - 95%
Altitude (m)	＜2,000
Warranty	5 Years
Safety Standard	IEC62619/UN38.3
Scalability	Max 8 Pcs in Parallel

Testing conditions based on temperature 25℃ at the beginning of life.

*Total Energy/Usable Energy measured under specific conditions from IEC 62619

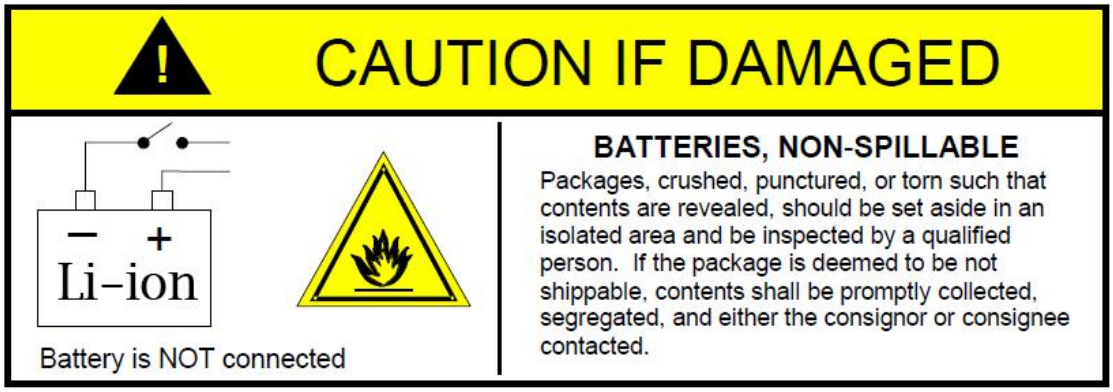
3. Guidance for Disconnection of Batteries During Shipment

3.1 Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed to be not shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.

3.2 The DC circuit of 48V 100Ah Rack Mounted Lithium Battery has been disconnected before outgoing.

3.3 A precautionary label had been affixed to the shipping carton to alert individuals as to the battery within the package have been disconnected; otherwise, the battery should not be transported.

3.4 We have conducted comprehensive tests to ensure the equipment they distribute around the world is safe for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. If the cartoon visibly damaged, please contract with distributor to confirm whether the battery could be used safely or not.



4. Installation Prerequisites

4.1 Installation Location

Make sure that the installation location meets the following conditions:

- The building is designed to withstand earthquakes, and the floor is flat and level.
- Far away from the sea to avoid salt water and humidity.
- The installed location should not be access by pet and children.
- No flammable or explosive materials nearby, at least 2.5m far away from combustible.
- Minimal dust and dirt in the area.
- No corrosive gases present, including ammonia and acid vapor.

The battery optimal operate temperature is 15°C to 30°C. Frequent exposure to severe operating condition would exacerbate the performance and lifetime of the battery.

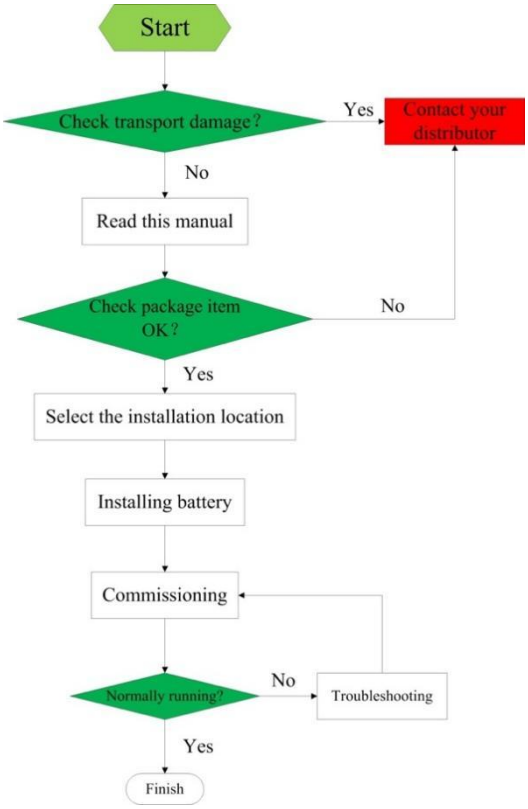
4.2 Installation Requirements

For safety used of battery, please notice following notes when install:

- The installation shall be in a restricted access location/ room or in a cabinet where provides a barriers for the battery terminal.
- The maximum number of battery shall be not over 8 PCS.
- DVC class specification: DVC-C for battery terminal, DVC-A2 for all communication terminals.

4.3 Installation Process

The battery should be installed according to the following flow chart.



4.4 Installation Materials

Following installation materials should be prepared by installers.

- Power cable
- Data cable
- Earth cable
- Ground wire
- Bipolar external isolator, when two or more battery systems in parallel, each of them shall have a bipolar isolator. Meanwhile, the isolator shall have ability to break the full load current.

NOTICE

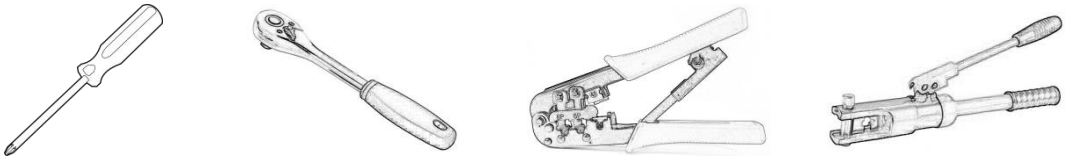
Make sure that the cross-sectional area of charging cables is 25 to 35 mm^2.

NOTICE

A breaker between battery and inverter was recommended to install, and the breaker's min. current should be over 150A or following with local regulations.

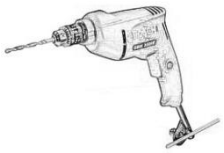
4.5 Tools

To install the battery pack, those following tools are probably required:



Phillips screwdriver | Torque wrench | Cable crimper | Wire clamp



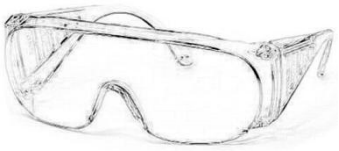



Voltmeter | Tape measure | Drill | Flat-head screwdriver

In order to protect operator and installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.

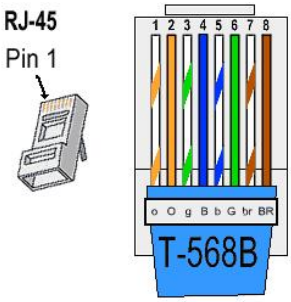
4.6 Safety Instruments

When dealing with the battery, following safety gears should be equipped. Installers must meet the relevant requirements of IEC 60364 or the domestic legislation and other relevant international standards.


Insulated glove | Safety goggles | Safety shoes

4.7 Network Cable



If needed, the network cable should be made like that diagram. But the cable should be made following the definition on battery side. If available, use a LAN cable tester to check whether the cable is faulty.

Definition of CAN communication (default Baud rate 500k)

Pin order	Definition
1, 2, 7, 8	NC
4	CAN-H
5	CAN-L
3, 6	GND

Definition of RS-485 communication (default Baud rate 19200)

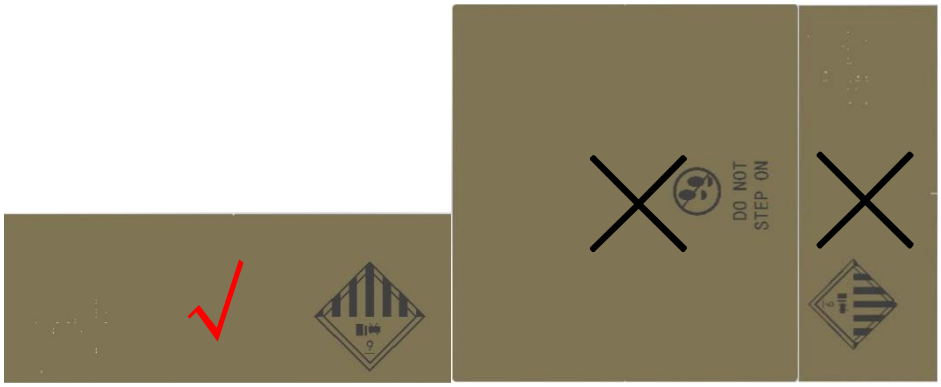
Pin order	Definition
1, 8	RS485-B
2, 7	RS485-A
3, 6	GND
4, 5	NC

4.8 Storage

If the battery is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it. Instructions for storage are:

- Do not stack more than 8 battery boxes.
- The temperature of battery stored recommended in the range of -20°C to 25°C.
- Do not expose to water

The battery box should be upright as shown in the following figure and not stacked upside down when storing the battery box.



If the battery needs to be stored over 3 months, the DC circuit of battery suggests to be disconnecting. Otherwise, the battery would discharge at a minimum rate and capacity degrades depended on storage time, the battery self-consumption less than 5w. And, if the battery stored over 6 months, it is suggested to connect the battery with inverter and commission the system.

5. Battery Installation

5.1 Checks Before Installation

There are a few things to check before installing the battery to ensure that it has no defects.

Check item 1: Check the battery voltage.

WARNING

If this checking process is executed for any reason after the battery is fully installed, make sure that the inverter is turned off or break the connection between battery and inverter while checking the battery.

Press and hold the panel button and then release it, measure the voltage at the terminal interface with a voltmeter. If the voltage is lower than 48 V, do not use the battery and contact distributor or your distributor.

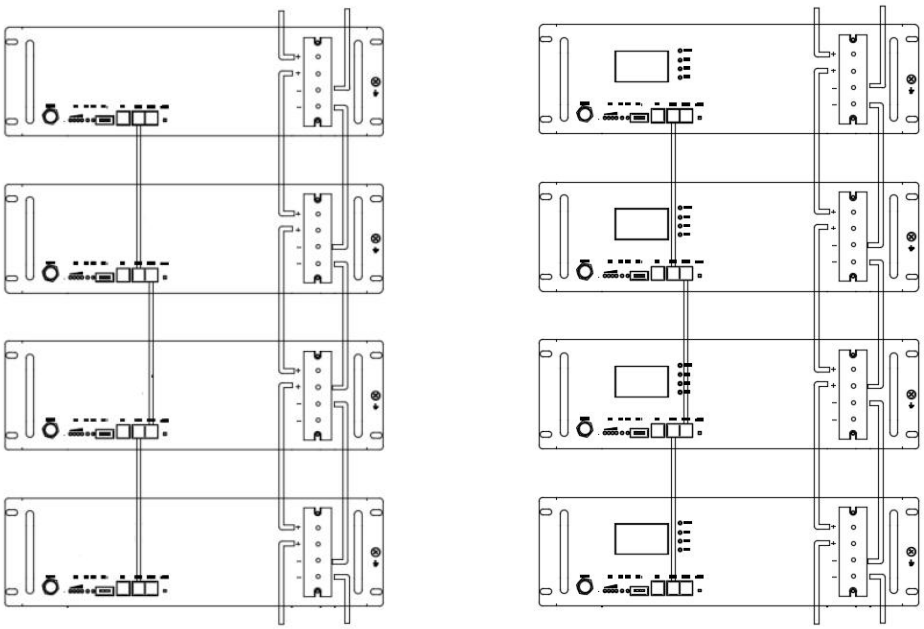
5.2 Installation the Battery

NOTICE

If the battery is installed above the floor or on a platform, make sure that the wall or platform is capable of supporting the battery's weight.

5.2.1 Ground Installation

battery 48V 100Ah Rack Mounted Lithium Battery could be installed on floor, the installation like the diagram



5.2.2 Address Select of Master and Slave Battery(-ies) Connection

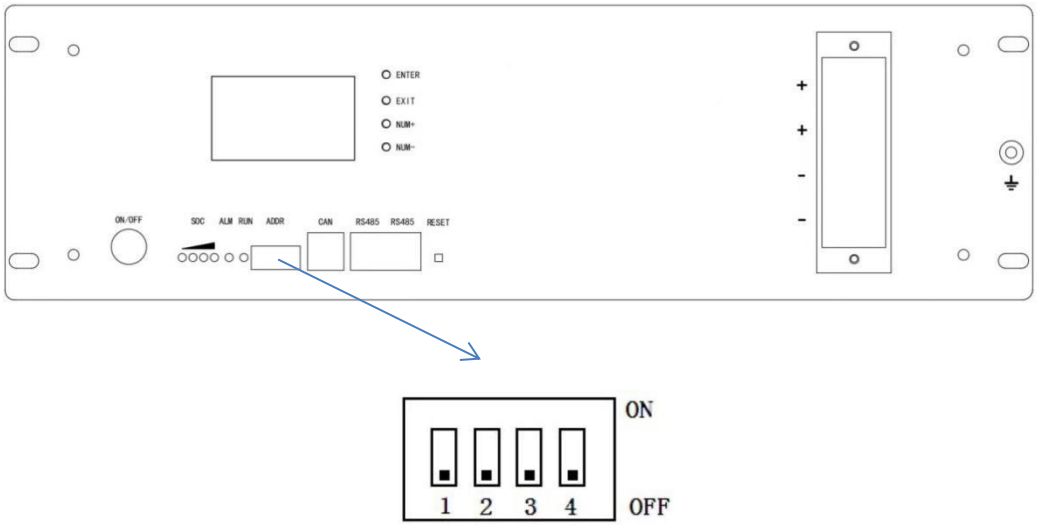


Table 5-1 DIP switch set of Subordinary battery(-ies)

Sub battery No.	DIP switch set				Introduction
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Pack 1
2	OFF	ON	OFF	OFF	Pack 2
3	ON	ON	OFF	OFF	Pack 3
4	OFF	OFF	ON	OFF	Pack 4
5	ON	OFF	ON	OFF	Pack 5
6	OFF	ON	ON	OFF	Pack 6
7	ON	ON	ON	OFF	Pack 7

Table 5-2 DIP switch set of Primary battery

Parallel Connection No.	DIP switch set				Introduction
	#1	#2	#3	#4	
1	OFF	OFF	OFF	OFF	1 battery
2	ON	OFF	OFF	ON	2 batteries
3	OFF	ON	OFF	ON	3 batteries
4	ON	ON	OFF	ON	4 batteries
5	OFF	OFF	ON	ON	5 batteries
6	ON	OFF	ON	ON	6 batteries
7	OFF	ON	ON	ON	7 batteries
8	ON	ON	ON	ON	8 batteries

NOTICE

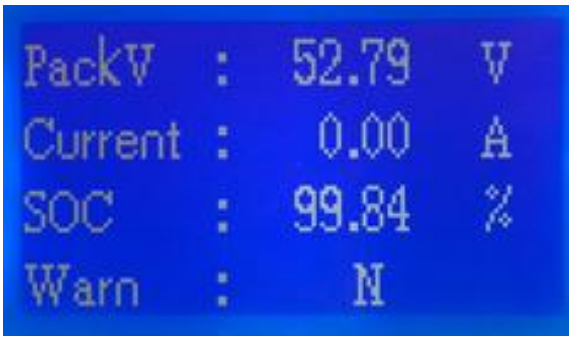
Before two or more batteries installed in parallel, please check the voltage of each battery and make sure the voltage different less than 2.0V.

NOTICE

But, if more than 4 batteries 48V 100Ah connected in parallel mode, the Primary and last Sub battery's power terminal interfaces all suggested to be used and linked with Inverter.

5.2.3 Screen Setting (optional)

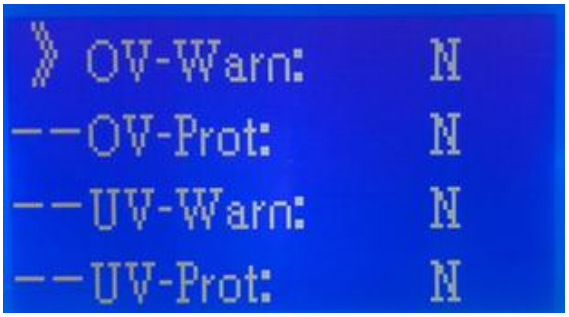
Press ENTER button to enter the screen page, press RETU button to return.



Key	Function	
ENTER	PackV	Total battery pressure
	Current	Current
	SOC	The remaining capacity
	Warn	Alert

Press GOOD or DOWN button to enter the screen page

Key	Function	
GOOD or DOWN	CellV	Cell voltage query
	Temoeraure	Temperature query
	Warn	Alarm query
	Capacity	Capacity query
	CellV01-Cel V16	Cell voltage value
	Temp1-Temp4	Cell temperature value
	Envir-temp	Ambient temperature
	PCB-temp	Power temperature



Key	Function	
DOOD or DOWN	OV-Warn	High voltage warning
	OV-Prot	Over voltage protection
	UV-Warn	Low-voltage warning
	UV-Prot	Under voltage protection
	OT-Warn	High temperature warning
	OT-Prot	Over temperature protection
	UT-Warn	Low temperature warning
	UT-Prot	Under-temperature protection
	OC-Warn	Over current warning
	OC-Prot	Over current protection
	CAPA-Warn	Remaining capacity alarm
	OFF-USE	Failure warning
	SCP	Short circuit protection
	FCC	Battery capacity
	Rm	The remaining capacity
	Cycle Time	Cycles

6 Commissioning

6.1 Commissioning Battery

If there is only one battery installed, use the following steps to put it in operation:

1. Press the panel button, after the indicator lights on, release the panel button.
2. Make sure that the Run light is on. If it stays off, do not use the battery and contact or your distributor.
3. Turn the inverter on, and wait for the start-up sequence to complete fully.

When there are two or more batteries connected with parallel mode, after the charging cable and the data cable has been connected correctly, follow these steps to put them in operation:

1. Check battery voltage level is above 48V
   a) If battery voltage is under 45V contact your distributor for help.
2. Release the panel button, after few seconds the indicator lights off.
3. Before Commission the system, please pay attention on following tips:
   a) For all batteries, make sure that the Run light is on.
   b) Make sure the maximum voltage different between batteries less than 1.5V.
   c) If not, the installer should balance the battery voltage and then parallel connect batteries together.
   d) Set the DIP switches like **Table 5-1** and **Table 5-2**.
4. Turn the inverter on, and wait for the start-up sequence to complete fully.

6.2 Shutting Down Battery

Shut down the battery only when the battery under standby status.

1. Release the Panel Button, after few seconds the battery will turn off itself.
2. Make sure that every light on the battery is off.