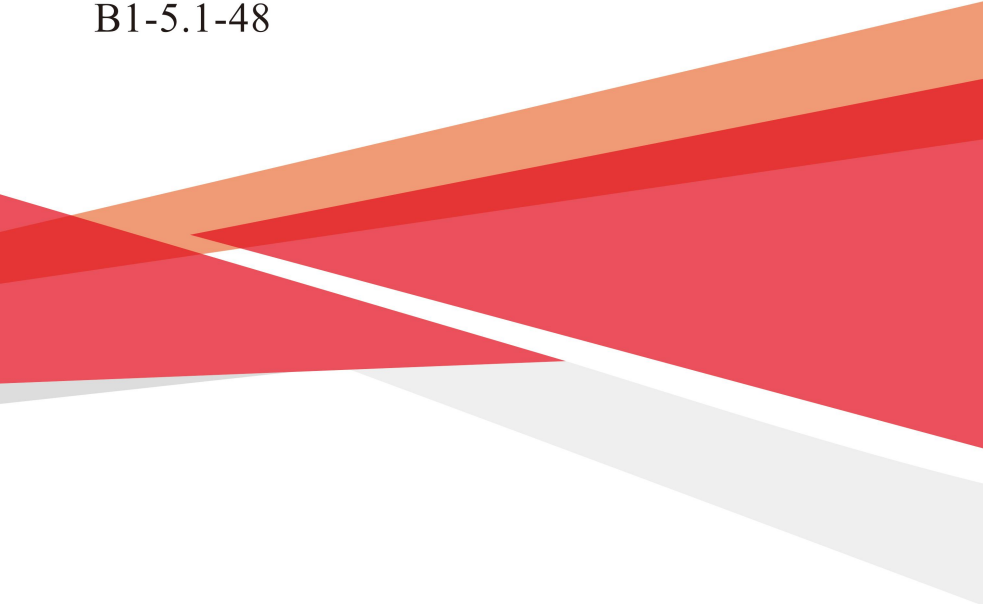


# User Manual

B1-5.1-48



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# Chapter 1 Safety Precautions

The User Manual describes system configuration and detailed procedures for installation, operation and maintenance of B1 Series Inverter Battery. However, this manual does not include any information about inverters that the battery may be applied to. Please read the User Manual before using this product.

## 1.1 Safety Instructions



### DANGER

- Do not expose the battery to temperatures in excess of 45°C.
- Do not subject the battery to any strong force.
- Do not place the battery near a heat source, such as direct sunlight, a fireplace.
- Keep inflammable and explosive dangerous items or flames away from the battery.
- Do not soak the battery in water or expose it to moisture or liquids.



### WARNING

- Only qualified personnel who has full knowledge of local safety regulations and local standards on battery can install, maintain, retrieve and process this product.
- Manufacturer shall not be liable for any loss or warranty claims arising from any unauthorized change of product which may cause fatal injury to the operator, third party or equipment performance.
- For personal and property safety, do not short-circuit the positive (+) and negative (-) electrode terminals.



### CAUTION









- Do not modify or change any components in the battery.
- Risk of damage due to improper modification



### NOTICE

- During installation of the battery B1, circuit breaker must be disconnected from the battery pack wiring.
- The battery B1 can only be used as a set with manufacturer’s AS1 and H1 series storage inverter, otherwise it cannot be used normally.

## 1.2 Explanations of Symbols

Symbol	Description
	<b>Dangerous electrical voltage</b> The device is directly connected to public grid, thus all work to the battery shall only be carried out by qualified personnel.
	<b>No open flames</b> Do not place or install near flammable or explosive
	<b>Danger of hot surface</b> The components inside the device will release a lot of heat during operation. Do not touch metal plate housing of the inverter during operating.
	<b>Attention</b> Install the product out of reach of children
	<b>An error occurred</b> Read the usage manual to troubleshoot problems
	<b>This device SHALL NOT be disposed of in residential waste</b> Please go to Chapter 8 “Recycling and Disposal” for
	<b>CE Mark</b> The device is in compliance with Low Voltage Directive and Electromagnetic Compatibility.
	<b>Recyclable</b>

## 1.3 Emergency Situation

Despite of its strict and professional protection design against any hazard results, damage of the battery may still occur. If a small amount of battery electrolyte is released due to a serious damage of the outer casing; or if the battery explodes due to not being treated timely after a fire breaks out nearby, and leaks out poisonous gases such as carbon monoxide, carbon dioxide and etc., the following actions are recommended:

1) Eye contact: Rinse eyes with a large amount of running water and seek medical advice

2) Contact with skin: Wash the contacted area with soap thoroughly and seek medical advice

3) Inhalation: If you feel discomfort, dizziness or vomiting, seek medical advice immediately.

4) Use a FM-200 or Carbon Dioxide (CO<sub>2</sub>) fire extinguishers to extinguish the fire if there is a fire in the area where the battery pack is installed. Wear a gas mask and avoid inhaling toxic gases and harmful substances produced by the fire. 5) Use an ABC fire extinguisher, if the fire is not caused by battery and not spread to it yet.



### Warning

·If a fire has just occurred, try to disconnect the battery circuit breaker and cut off the power supply first, but only if you can do so without endangering yourself.

·If the battery is on fire, do not attempt to extinguish the fire and evacuate the crowd immediately.

Potential danger of damaged battery:

Chemical Hazard: Despite of its strict and professional protection design against any hazard results, rupture of battery shall may still occur due to mechanical damage, internal pressure and etc., and may result in a leakage of battery electrolyte. The electrolyte is corrosive and flammable. When there is fire, the toxic gases produced will cause skin and eyes irritation, and discomfort after inhalation. Therefore:

- 1) Do not open damaged batteries;
- 2) Do not damage the battery again (shock, fall, trample, etc.);
- 3) Keep damaged batteries away from water (except to prevent an energy storage system from catching fire);
- 4) Do not expose the damaged battery to the sun to prevent internal heating of the battery.

Electrical hazard: The reason of fire and explosion accidents in lithium batteries is battery explosion. Here are the main factors of battery explosion:

1) Short circuit of battery. Short circuit will generate high heat inside battery, resulting in partial electrolyte gasification, which will stretches the battery shell. The temperature reaching ignition point of internal material will lead to explosive combustion.

2) Overcharge of battery. Overcharge of battery may precipitate lithium metal. If the shell is broken, it will come into direct contact with the air, resulting in combustion. The electrolyte will be ignited at the same time, resulting in strong flame, rapid expansion of gas and explosion.

# Chapter 2 Product Introduction

## 2.1 Application Scope of Products

The battery B1 is applied to domestic photovoltaic storage system. The battery is built eternally with a battery management system (BMS), which is used to ensure efficiency of the battery and to avoid phenomena of overcharge or over-discharge. The battery employs modular design for easy installation and wiring, and can be used by up to 3 parallel devices. B1 battery is also called slave machine in the following text.

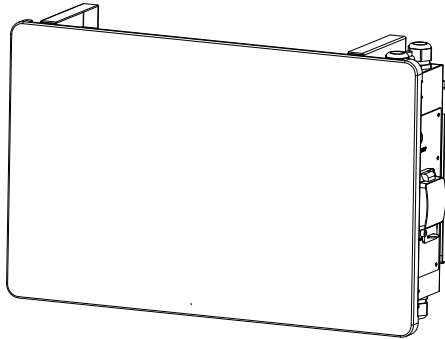


Figure 2.1 B1 outside overview

## 2.2 Specification for Product Model

B1 – XX – XX  
①      ②      ③

B1 represents for product name

XX represents total energy capacity XXKWh, e.g., 5.1 means 5.1kWh

XX represents voltage grade , for 48 means 48V

## 2.3 Datasheet


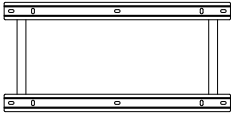




### B1-5.1-48

Type	B1-5.1-48
<b>Electrical Characteristics</b>	
Total Energy Capacity[Wh]	5120
Usable Capacity [Wh]	4600
Rated Voltage [V]	51.2
Voltage range [V]	42~58.4
Depth Of Discharge[DOD]	≤90%
Cycle Life	≥6000
Max.Charge Current [A]	60
Max.Discharge Current [A]	60
<b>Physical Parameters</b>	
Battery Type	Lithium ion
Communication	CAN
Operating Temperature Range	0°C~50°C
Cooling Method	Natural Convection
Ambient Humidity	0-95% Non-condensing
Ingress Protection	IP65
Dimensions[H*W*D][mm]	410*650*186
Weight [kg]	48
Standard Warranty [Year]	5(Standard)/10(Optional)
Applicable Standard	UN38.3、IEC62619



# Chapter 3 Instructions for installation

## 3.1 Items in the Package

			
Battery pack		Wall bracket	
			
Mounting bolts set *6	Cables& bolts*4	Ethernet cable&RJ45 plug	User Manual

## 3.2 Installation Position

The battery dimensions shown as follows

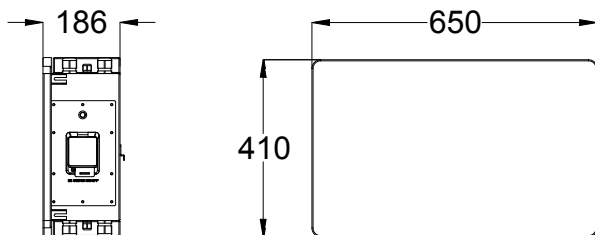


Figure 3.1 B1-5.1-48 External view and dimension

### 3.2.1 Installation Position

This device is cooled by natural convection and an indoor installation is recommended or an installation under a sheltered place to prevent the battery from exposure to direct sun, rain and snow erosion.

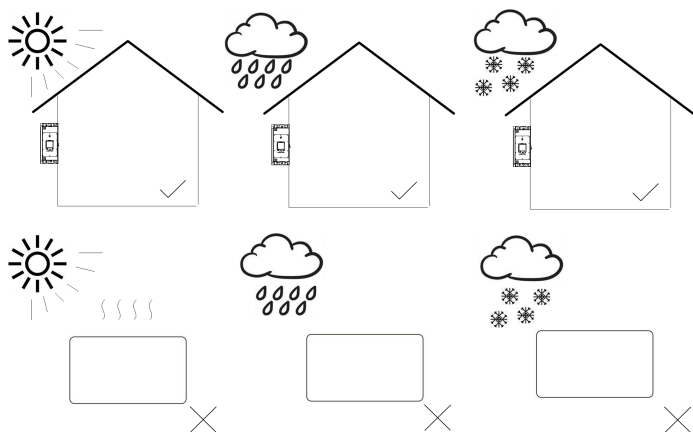


Figure 3.2 Mounting Method

### 3.2.2 Mounting Method

A vertical mounting is recommended and the battery accepts tilted backwards by max.15° . Never mount the battery horizontally or upside down.

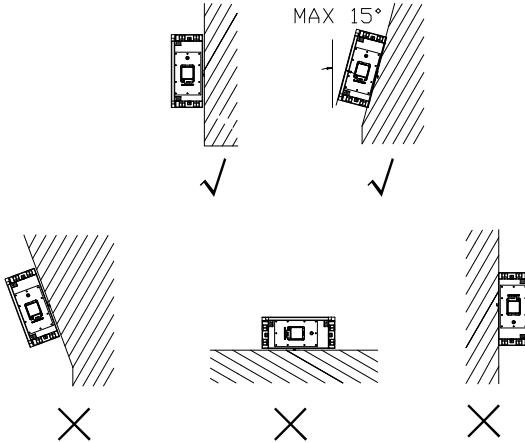


Figure 3.3 Mounting method

Please make sure the battery pack is at all times exposed to the air. Poor air circulation will affect the performance of internal electronic components and shorten the service life of battery.

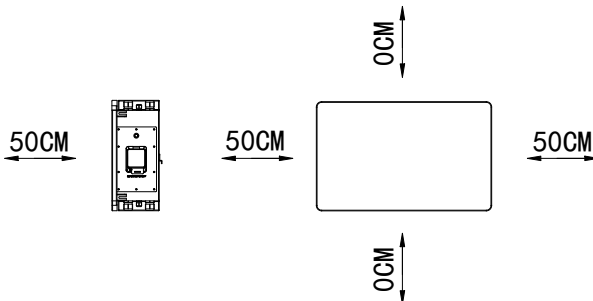


Figure 3.4 Installation position

### 3.3 Mounting Procedure

#### 3.3.1 Positioning the Drilled Holes for Bracket

The battery B1 uses free-standing installation and its position is determined by the drilled holes of bracket, Unit: mm.

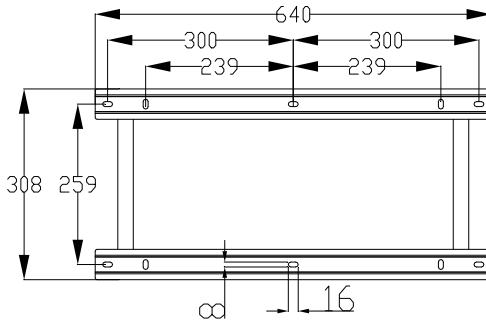


Figure 3.5 Bracket for B1-5.1-48 (Slave machine)

Make sure that the wall is capable of mounting screws and supporting the weight of the battery pack before installation. Mark the location of bracket's holes on the wall and drill the holes. Then use a rubber hammer to drive screws into the holes.

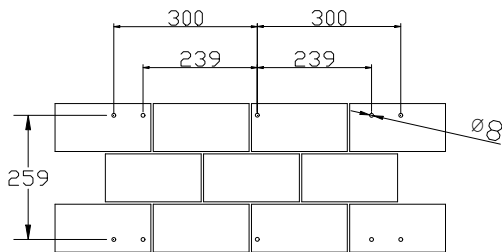


Figure 3.6 Bracket for B1-5.1-48 (Slave Machine)

AS1-3KS-5.1 is a master machine while B1-5.1-48 is a slave machine. To ensure the installation of the device is successful, the distance between master and slave machine, slave and slave machine shall at least meet the following requirements:

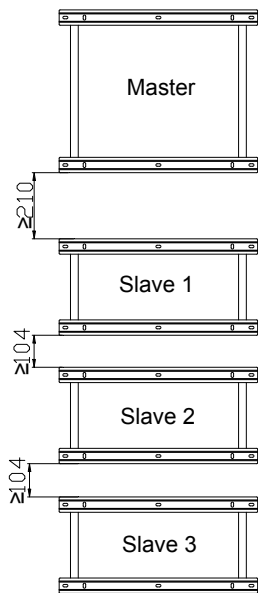


Figure 3.7 Distance between brackets

Fix the brackets in the marked position with hex screws.

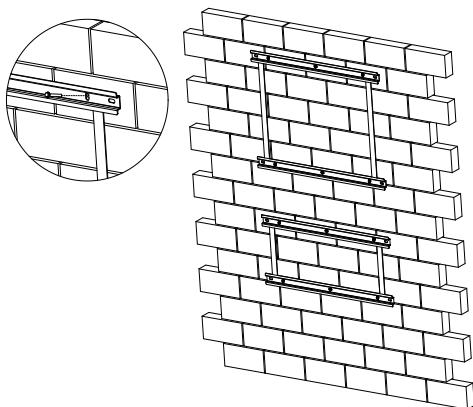


Figure 3.8 Mounting the brackets

During installation of the device, please install the slave machines first then the master machines, in order to avoid a failure of installation due to a lack of space between the master machine and the slave machines. Carefully mount the device onto the brackets and make sure the bottom of the device is attached to the brackets.

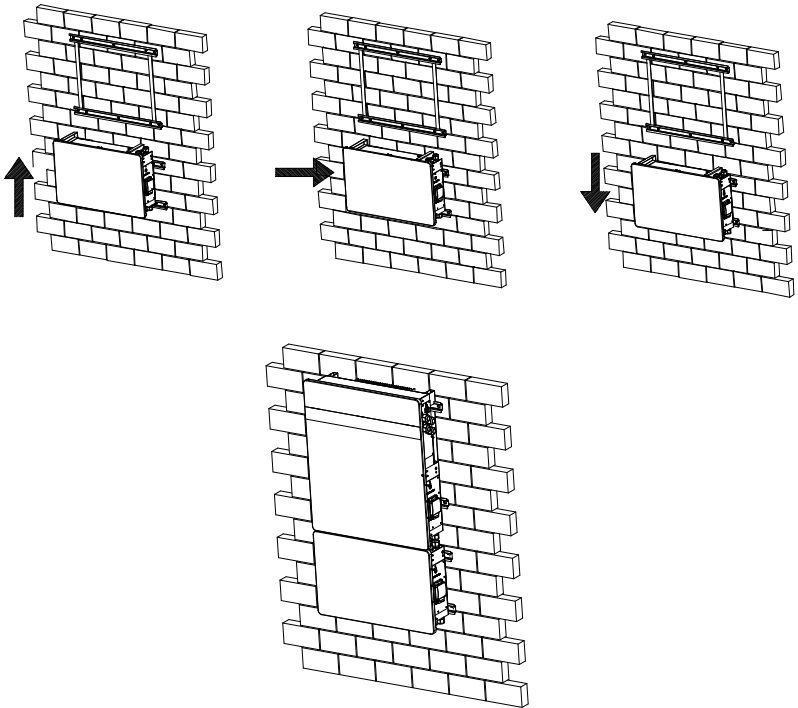


Figure 3.9 Installation of the master and slave machines

One master machine can be matched with up to three more batteries. During the installation of the project, it is necessary to consider whether space shall be reserved to add new battery packs in the future. The expansion diagram is as follows.

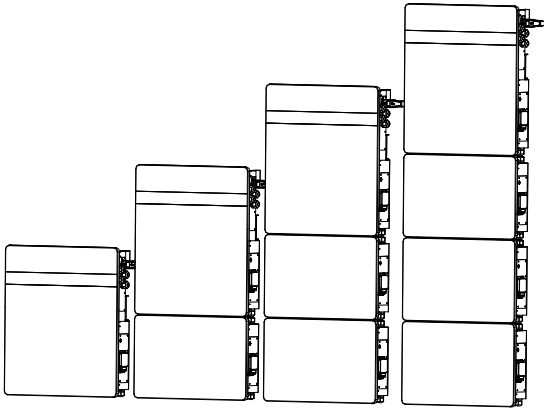


Figure3.10 Batteries Expansion Diagram

# Chapter4 Electrical Connection

## 4.1 Specifications for Electrical Interface

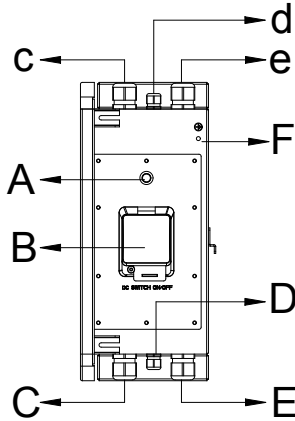


Figure 4.1 B1-5.1-4 Interface

Code	Name
A	Battery switch
B	DC switch
C,c	BAT+port
D,d	BMS LINK port
E,e	BAT- port
F	Ground

Table 4.1 Interface instruction



## 4.2 Slave Connection

Make sure that the circuit breaker is off, remove the right wiring cover screw and pull out the BMS switch cable then place the cover aside.

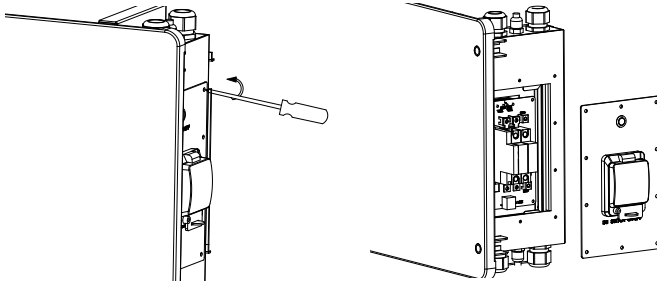


Figure 4.2 Removing wiring cover

Remove the flange nut head counterclockwise, and remove it when there is a hole plug, as shown in the figure below. Then pass the original cable through the waterproof jacket.

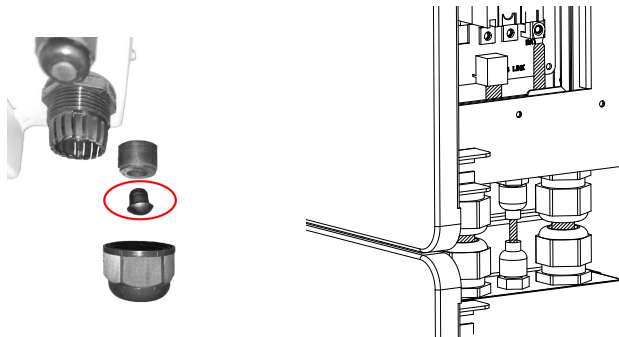


Figure 4.3 Threading diagram

Only 3 cables are required (BAT+-BAT, BAT--BAT-, LINK-LINK) to connect a slave. Be careful when connecting. Do not reverse the positive and negative terminals.

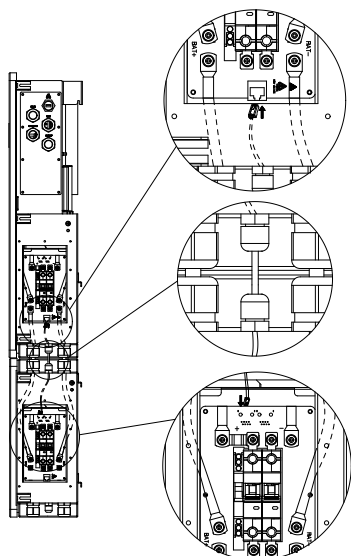


Figure 4.4 Connection diagram

### 4.3 Communication Interface

Take out the Ethernet cable from the battery packaging.

Note: Pass the cable through the waterproof jacket firstly and then crimp the RJ45 plug.

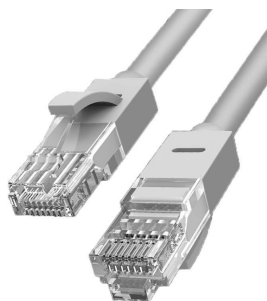
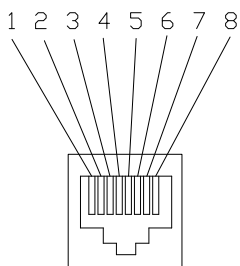


Figure 4.5 Interface definition

Code	Name
1	blank
2	blank
3	blank
4	blank
5	blank
6	blank
7	RS485A
8	RS485B

Table 4.2 Interface pin description

**!** Attention

- Please use the original matching battery cable
- Do not connect one B1 battery to two inverters at the same time
- The waterproof sheath must be tightened after wiring to prevent rain water from entering the interior

## 4.4 Install the Right Cover

Use the screw previously removed to lock the cover plate. Torque is recommended 14kgf.cm.

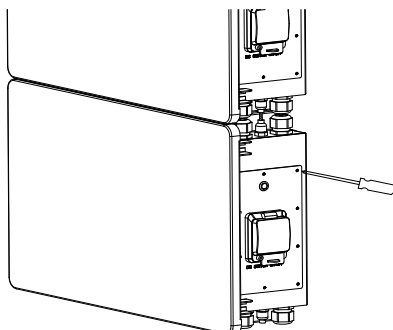


Figure 4.6 Install the right cover

## 4.5 Ground Connection

After penetrating the external hex head screw through OT terminal of the grounding line, screw in the grounding port of inverter enclosure in clockwise direction.

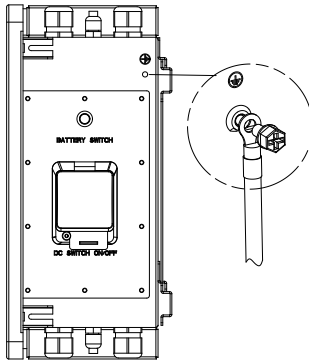


Figure 4.7 Ground connection

# Chapter 5 Debugging Instructions

## System Commissioning

After the wiring is completed, please refer to the AS1 series or H1 series manual for system operation.

Note: Turn on the battery switch and BMS switch when using the B1 battery.

# Chapter 6 Battery maintenance

## 6.1 Transportation

Lithium batteries are dangerous goods. Passed the test of UN38.3, this product meets the transportation requirements for dangerous goods for lithium batteries. After the installation of the battery on site, the original packaging (contains the lithium battery identification) should be kept. When the battery needs to be returned to the factory for repair, please pack the battery with the original packaging to reduce unnecessary trouble.

## 6.2 Storage

After purchasing the battery, please store it with following instructions:

- 1) Please store it in a dry and ventilated environment, keep it away from heat sources;
- 2) Please keep it in an environment with storage temperature as  $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$ , humidity  $<85\% \text{ RH}$ ;
- 3) For long-term storage ( $>3$  months), please put it in an environment with a temperature of  $18^{\circ}\text{C}$  to  $28^{\circ}\text{C}$  and a humidity of  $<85\% \text{ RH}$ ;
- 4) The battery should be stored in accordance with the storage requirements mentioned above, and the battery should be installed within 6 months since delivered from the factory and used with compatible inverters;



#### Notice

- The battery remains 40% power when it is sent from the factory.
- The longer the battery is stored, the DOD value is getting bigger. When the battery remaining voltage fails to reach the startup voltage requirement, the battery may be damaged.
- Judgment condition: Close the battery breaker switch and press the BMS switch. At this time, if the LED light is flashing, it is running normal. If the LED light is off, the battery is in faulty.

The battery cannot be disposed of as household refuse. When the service life of the battery reaches to its limit, it is not required to return it to the dealer or manufacturer, but it must be recycled to the special waste lithium battery recycling station in the area.

# Warranty Card

The installer should fill in the second form while installing the inverter. For warranty claim, please complete the below forms and send this page to manufacturer, attached with the Customer's invoice.

## For customer to fill in

Name:		
City:	Country:	Zip:
Tel:	Fax:	E-mail:

## Information on device

Device type:	Serial No.(S/N):
Invoice No:	Commissioning date:
Fault time:	
Error message (Display reading):	
Brief fault description & photo:	
Signature: _____ Date: _____	



**For installer to fill in**

Modules used:		
Modules per string:	No. of string:	
Installation company:	Contractor license number:	
Company:		
City:	Country:	Zip:
Tel:	Fax:	E-mail:
Signature: _____ Date: _____		





