



# SmartBee-5120MT

Low Voltage Battery System

## User Manual





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# 1 Notes on this Manual

## 1.1 Target Group

This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified personnel.

## 1.2 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

 Danger	<b>Danger!</b> “Danger” indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 Warning	<b>Warning!</b> “Warning” indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 Caution	<b>Caution!</b> “Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	<b>Note!</b> “Note” provides tips that are valuable for the optimal operation of our product.

## 2 Safety

### 2.1 Important Safety Instructions



Danger

#### **Danger!**



- Electric shock and high voltage.
- Do not expose the storage unit to temperatures in excess of 45°C.
- Do not subject the storage unit to any strong force.
- Do not touch uninsulated cable termination.
- Do not soak the storage unit in water or expose it to moisture environment.
- Do not touch the case of the storage unit when it is wet in case of electric shock.
- Do not dispose of batteries in fire. The batteries may explode!
- Do not place the storage unit near a heat source, such as direct sunlight, a fireplace.
- Keep inflammable and explosive dangerous items or flames away from the storage unit.
- Do not charge or discharge damaged storage unit.
- Before performing any work on the storage unit, please disconnect the storage unit from all voltage sources as described in this document.



Warning







#### **Warning!**

- Installation, repair, recycling, and disposal of storage unit must be performed by qualified personnel in accordance with national and local standards and regulations.
- Risks of chemical burn electrolyte or toxic gases.
- Do not place heavy objects on the top of the system.
- If the moisture penetrates the system (e.g., due to casing damage), please do not install or operate the system.
- Do not use wet hands to touch the system.
- Any behavior to change the functionality of the product without permission will cause fatal injury to the operator, third parties, and equipment. SmartBee-5120MT is not responsible for these losses and warranty claims.
- To ensure property and personal safety, the batteries and inverter shall be well grounded.

 <p>Caution</p>	<p><b>Caution!</b></p> <ul style="list-style-type: none"> <li>• Do not modify or tamper with storage unit and other components of the system.</li> <li>• Risk of injury by hoisting or falling system</li> <li>• Batteries are heavy and personal injury can be caused if the battery is improperly lifted or dropped during transport or improper operation when attached or removed from walls. Lifting and moved the products shall be conducted by more than one person.</li> </ul>
	<p><b>Note!</b></p> <ul style="list-style-type: none"> <li>• Do not extend other brands of batteries at the battery port.</li> </ul>

## 2.2 Explanation of Symbols


This section explains all the symbols shown on the inverter and on the type label.

	<p>CE mark. The system complies with the requirements of the applicable CE guild lines.</p>
	<p>Dangerous electrical voltage Do not touch any internal parts of the device being disconnected from the mains, battery for 5 minutes.</p>
	<p>Danger of hot surface The components inside the device will release a lot of heat during operation. Do not touch metal plate housing of the device during operating.</p>
	<p>Danger. Risk of electric shock!</p>
	<p>An error occurred Read the usage manual to troubleshoot problems</p>
	<p>Recyclable</p>

## 2.3 Emergency situation

Despite of its careful 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 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.

	<p><b>Warning!</b></p> <ul style="list-style-type: none"><li>● 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.</li><li>● If the battery is on fire, do not attempt to extinguish the fire and evacuate the crowd immediately.</li></ul>
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Potential danger of damaged battery:

Chemical Hazard: Despite of its careful and professional protection design against any hazard results, rupture of battery shall still occur due to mechanical damage, internal pressure 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 stretch 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.



## 3 Introduction

### 3.1 Product Model Description

SmartBee - 5120 MT

①            ②            ③

- ① SmartBee is the name of the battery system.
- ② 5120:5.12kWh /2560:2.56kWh/3580:3.58kWh.
- ③ MT: Wall hanging.


### 3.2 Datasheet


Battery Module	SmartBee-5120MT
<b>Electrical Parameter</b>	
Battery Type	LiFePO <sub>4</sub>
Battery Capacity per Kit [Wh]	5120
Usable Energy [Wh]	4600
Rated Voltage [V]	51.2
Voltage range [V]	44.8-57.6
Max. Charging and Discharging Rate	100A
Depth Of Discharge [DOD]	≤90%
Cycle Life(25 °C,0.5C)	≥6000 times,80% Capacity retention
Scalability	Yes (up to 20.48kWh)
<b>General Data</b>	
Communication Mode	RS232/CAN2.0
Operating Temperature Range	0~50°C (Charge)/-10~50°C(Discharge)
Storage Temperature Range	-15°C~60°C
Cooling Method	Natural Convection
Altitude	<1000m
Ambient Humidity	20-95% non-condensing
Noise[dBA]	<25
Ingress Protection	IP20
Dimensions [H*W*D][mm]	630*453*182
Weight [kg]	51.2kg

## 4 Installation Instructions

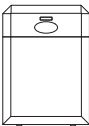

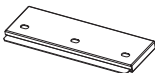
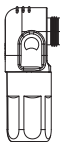
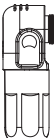

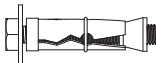

### 4.1 Safety Tips



This manual is an integral part of SmartBee-5120MT

	<p><b>Danger!</b></p> <ul style="list-style-type: none"> <li>● Potential fires and electric shocks that are life threatening.</li> <li>● Do not place any flammable or explosive materials beside storage unit.</li> <li>● Equipment connected to high-voltage power generation equipment must be performed by qualified personnel in compliance with national and local standards and regulations.</li> </ul>
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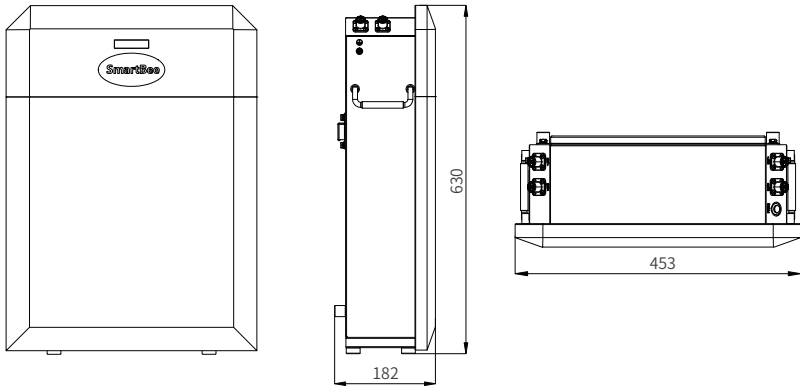
	<p><b>Note!</b></p> <ul style="list-style-type: none"> <li>● The pollution level applicable to storage unit is Class II.</li> <li>● Inappropriate or inconsistent installation environment can shorten the life of storage unit.</li> <li>● Do not install storage unit directly by exposing it under strong sunlight.</li> <li>● Please do not install in damp places.</li> <li>● The installation location must be well ventilated.</li> </ul>
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### 4.2 Packing List

			
SmartBee-5120MT X 1 pcs	User Manual X 1 pcs	Bracket X 1 pcs	Orange terminal-Battery Plug X 2 pcs
			
Black terminal-Battery Plug X 2 pcs	RNB5.5-5 X 2 pcs	expansion bolt X 3 pcs	Network cable (1m) X 1 pcs

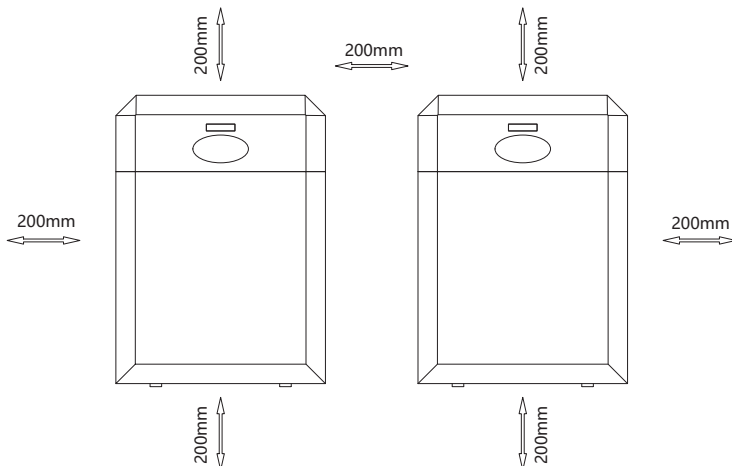
	
Qualified Certificate X 1 pcs	Packing List X 1 pcs

### 4.3 Determine the installation method and location



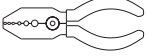


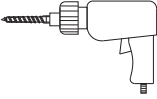
SmartBee-5120MT (mm)

Please ensure that the air at the installation point is circulated. Bad air ventilation will affect the working performance of internal electronic components and shorten the service life of storage unit.




## 4.4 Installation

### Tools

			
Crimper	Mark Pen	Knife	Electric drill

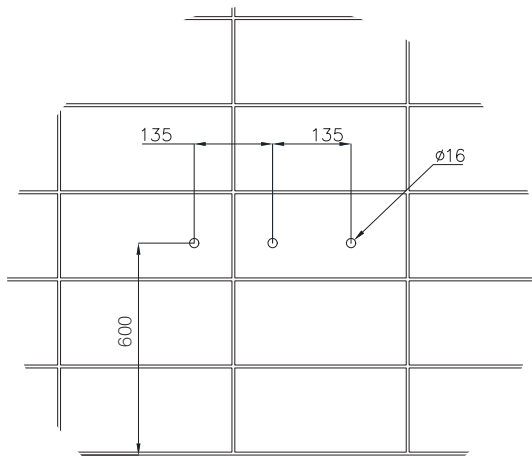
### Wall-mounted installation

The device shall be indoor installed and vertical placed. The place where it is installed shall be able to ensure the stability and safety of the product.

	<p><b>Note!</b></p> <ul style="list-style-type: none"> <li>• The SmartBee-5120MT must be mounted with a bracket to keep it stable!</li> </ul>
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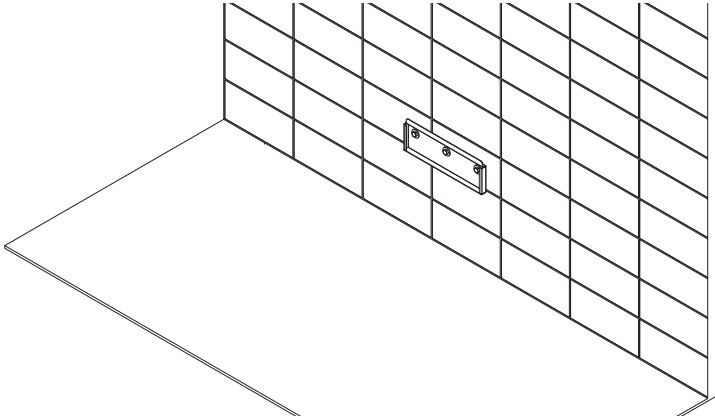
### Step1: Drilling hole.

Choose a suitable location to place the mounting bracket, and there should be no obstructions within 200mm to avoid affecting heat dissipation. Put the mounting bracket properly on the wall, The distance between the perforation and the floor needs to be >600mm.mark these 3 drill holes using a marker pen. Drill 3 holes on the wall, Insert the expansion screw vertically into the hole.

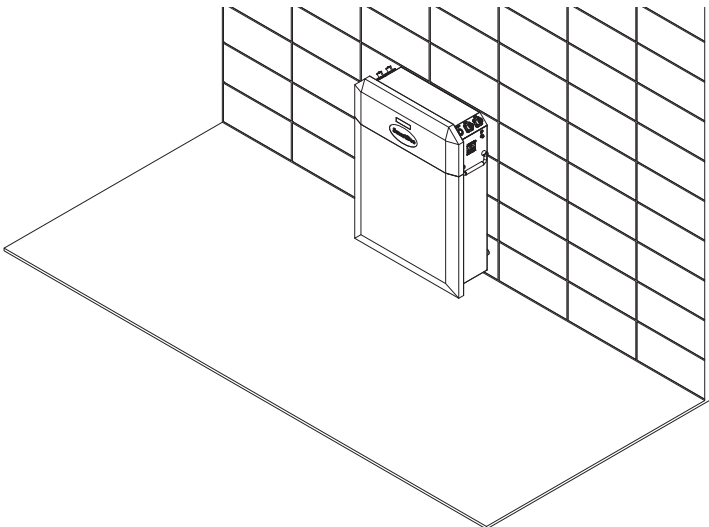


**Step2: Mounting Bracket (on the wall).**

After installing the expansion screws, install the mounting bracket and tighten the 3 screws.

**Step3: Installation.**

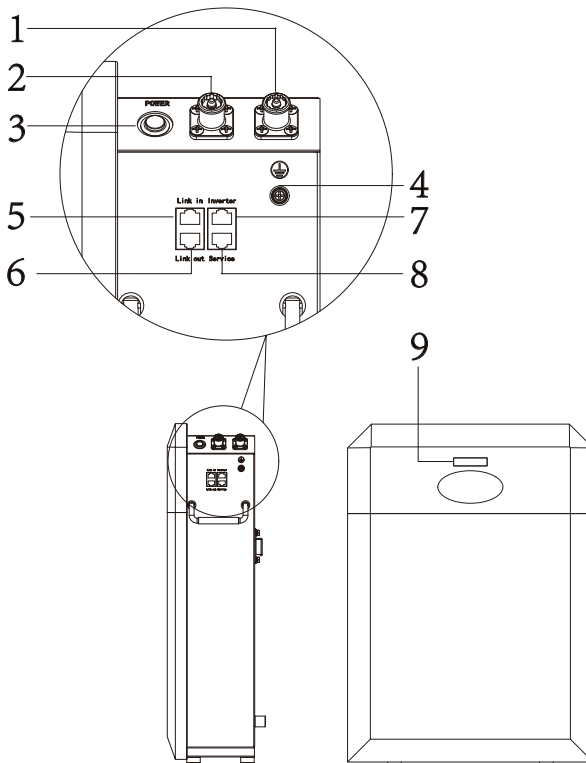
Lift the SmartBee and mount it to the wall bracket.



## 5 Electrical Connections


### 5.1 Electrical Interface Description

SmartBee-5120MT interface description



Object	Description	Object	Description
1	Battery -	6	Link out port
2	Battery +	7	Inverter port
3	Battery button	8	Service port
4	Grounding	9	LED
5	Link in port	/	/

## 5.2 Wiring

	<p><b>Warning!</b></p> <ul style="list-style-type: none"> <li>• Ensure Battery switch is off during installation to avoid the risk of short circuit caused by wrong operation during battery wiring.</li> </ul>
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### 5.2.1 Wire Processing

Cable type	Conductor cross-sectional area (mm <sup>2</sup> )	
	Outside diameter (mm)	Conductor core section (mm)
4 AWG	10	6.8

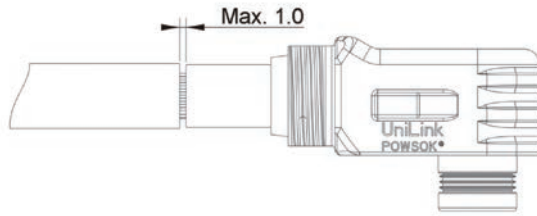
**Step 1:** Prepare the cable. The stripping operation must not cut any cable strands, insulation or jacket at places other than specified by the cable stripping dimensions. Take care that the individual strands of the cable are not be bent and that the insulation or jacket is not damaged. The surface must be clean and free of contamination.



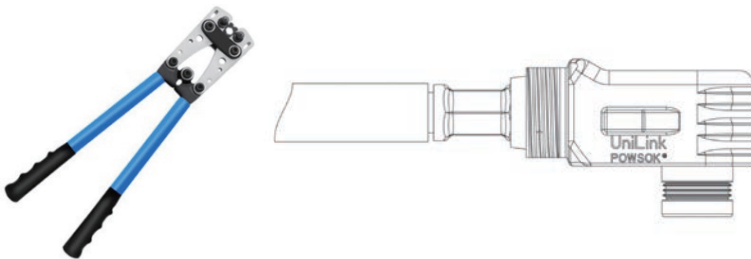
**Step 2:** Apply the cable onto the crimping position

Before crimping, the center terminal must be positioned to fulfill following conditions:

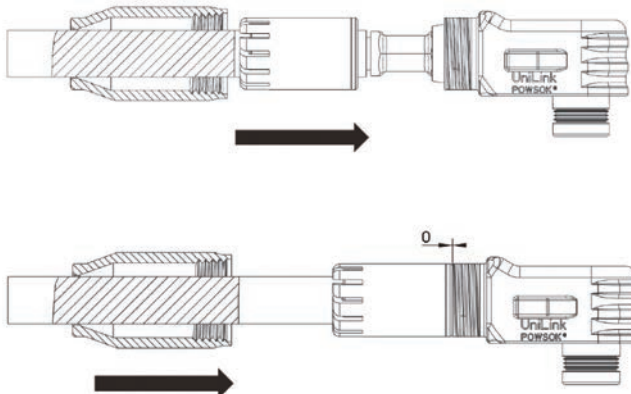
- A max. air gap of 1 mm is allowed between the shoulder of the cable insulation.
- All strands must be positioned in the crimp barrel.



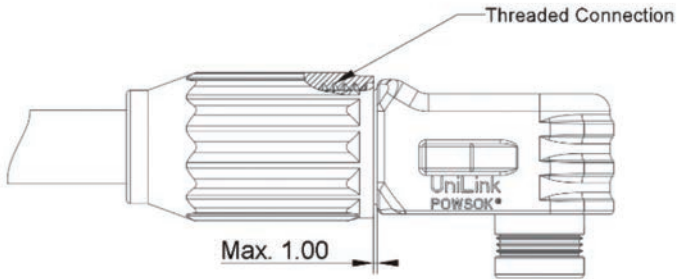
**Step 3:** Use a special tool to crimp the cable to ensure that the crimping is intact.



**Step 4:** Structure and assembly of plug. Slide cable seal assy. Until it is fully locked.





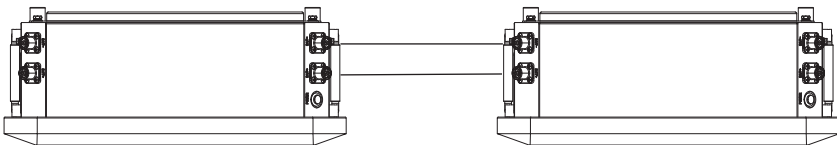


### Warning!

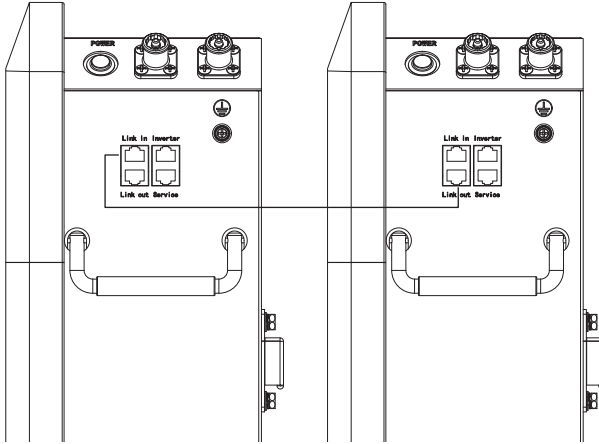
- Both sides of the battery parallel harness are terminal-Battery Plug.
- According to different inverter instructions, select the crimp terminal on the inverter connection side.

### 5.2.2 Parallel

Using the method shown in 5.2.1, make a parallel harness with terminal-Battery Plugs on both sides, Bat+ to Bat+ (Orange to Orange), Bat- to Bat- (Black to Black).

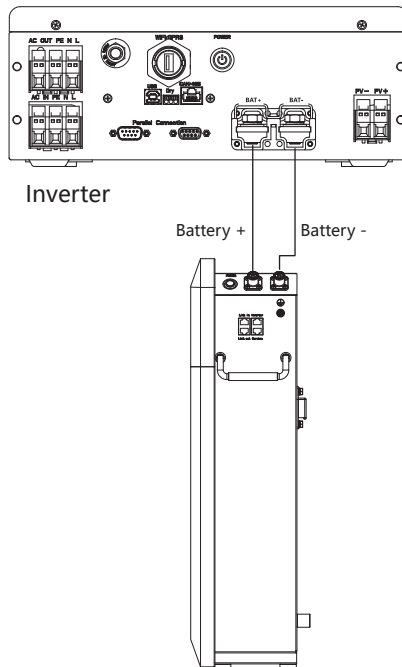


Communication network cable connection: Link out communication port of the first machine (the one connected to the inverter is the first machine), connect to the Link in communication port of the second machine.

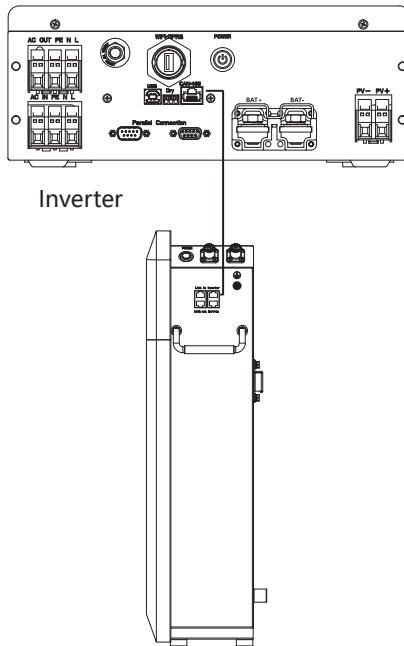


### 5.2.3 Connecting the inverter

Using the method shown in 5.2.1, make the inverter connection harness with terminal-Battery Plug on one side, Orange terminal-Battery Plug (Bat+ ) to Inverter Bat+, Black terminal-Battery Plug (Bat-) to Inverter Bat-.



Communication network cable connection: Inverter communication port of the first machine (the one connected to the inverter is the first machine) is connected to the BMS communication port of the inverter.



## 6 LED indication

### LED status

Battery Status	Protection, alarm normal	RUN	ALM	Capacity						Description
		Green	Red	Green	Green	Green	Green	Green	Green	
Off	/	Off	Off	Off	Off	Off	Off	Off	Off	All off
On	Normal	Flash 1	Off	Display based on actual capacity						No charging or discharging
	Warning	Flash 1	Flash 3							PACK low voltage
Charge	Normal	ON	Off	Display based on actual capacity (Maximum power level indicator LED Flash 2)						/
	Warning	ON	Flash 3							/
	Over Charge	On	Off	ON	ON	ON	ON	ON	ON	Stop charging
	Over Temp/Curent,Failure	Off	On	Off	Off	Off	Off	Off	Off	
Discharge	Normal	Flash 3	Off	Display based on actual capacity						/
	Warning	Flash 3	Flash 3							/
	Over Discharge	Off	Off	Off	Off	Off	Off	Off	Off	Stop discharging
	Over Temp/Curent,Failure	Off	On	Off	Off	Off	Off	Off	Off	
Failure	/	Off	On	Off	Off	Off	Off	Off	Off	Stop charging and discharging

Flash description:

Flash 1: 0.25s on/3.75s off

Flash 2: 0.5s on /0.5s off

Flash 3: 0.5s on,1.5s off

## 7 Battery Maintenance

### 7.1 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.

### 7.2 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  $-20\text{ }^{\circ}\text{C}\sim 50\text{ }^{\circ}\text{C}$ , humidity  $<85\%$  RH.
- 3) For long-term storage ( $>3$  months), please put it in an environment with a temperature of  $18\text{ }^{\circ}\text{C}$  to  $28\text{ }^{\circ}\text{C}$  and a humidity of  $<85\%$  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.

**Note!**

- The battery remains 30% 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.

The battery cannot be disposed of as household refuse. When the service life of the battery reaches to the limit, it is not required to return it to the dealer or SmartBee-5120MT, but it must be recycled to the special waste lithium battery recycling station in the area.

### **7.3 Cleanliness**

Clean the enclosure lid with moistened cloth with clear water only. Do not use any cleaning agents as it may damage the components.





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