

User Manual

N1C

LR-Series Lithium- Iron Phosphate Battery Module

(N1C.L4850EBM2U, N1C.L48100EBM3U)

Version: 1.1

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Thank you for purchasing N1C.L4850EBM2U, N1C.L48100EBM3U Lithium battery module. Please read this manual before you install the battery. Follow the instruction carefully during the installation process. To receive full warranty benefits and information register your product at <https://lithium-ion-ups.com/warrantyregistration/>

1. Safety Precautions



Reminder

- 1). It is very important and necessary to read the user manual carefully before installing or using the battery. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage the battery, potentially rendering it inoperable.
- 2) If the battery is stored for a long time, it is required to charge them every six months, and the SOC should be no less than 90%;
- 3) Battery needs to be recharged within 12 hours, after fully discharged;
- 4) Do not expose cable outside;
- 5) All the battery terminals must be disconnected for maintenance;
- 6) Please contact the supplier within 24 hours if there is something abnormal.
- 7) Do not use cleaning solvents to clean the battery;
- 8) Do not expose battery to flammable or harsh chemicals or vapors;
- 9) Do not paint any part of the battery, include any internal or external components;
- 10) Do not connect the battery with PV solar wiring directly;
- 11) The warranty claims are excluded for direct or indirect damage due to the items above.
- 12) Any foreign object is prohibited to insert into any part of the battery.



Warning

1.1 Before Connecting

- 1) After unpacking, please check the product and packing list first, if the product is damaged or missing parts, please contact the local retailer;
- 2) Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode;
- 2) Wiring must be correct. Do NOT misconnect the positive and negative cables, and ensure no short circuit with the external device.
- 4) It is prohibited to connect the battery and AC power directly.
- 5) The embedded BMS in the battery is designed for 48VDC, please DO NOT connect the battery in series.
- 6) Battery system must be well-grounded and the resistance must be less than 1Ω .
- 7) Please ensure the electrical parameters of the battery system are compatible with related equipment.
- 8) Keep the battery away from water and fire.

1.2 In Use

- 1) If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely shutdown
- 2) It is prohibited to connect the battery with a different type of battery
- 3) It is prohibited to put the batteries working with faulty or incompatible inverter;
- 4) It is prohibited to disassemble the battery (QC tab removed or damaged);
- 5) In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited.
- 6) Please do not open, repair, or disassembly the battery except staff authorized. We do not undertake any consequences or related

responsibility which because of violation of safety operation or violating of design, production, and equipment safety standards.

2. Introduction

N1C.L4850EBM2U, N1C.L48100EBM3U Lithium iron phosphate battery modules are new energy storage products. It is designed to integrate with reliable power modules such as UPS, solar inverter, and so on.

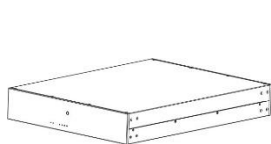
Both N1C.L4850EBM2U, N1C.L48100EBM3U are built-in smart BMS battery management system, which can manage and monitor cells' information including voltage, temperature, current, etc. Moreover, BMS can balance cells charging and discharging to extend cycle life. These two battery modules can be used alone or in parallel, to expand capacity for different requirements.

2.1 Features

- Non-Toxic, non-polluting, and friendly to the environment.
- LiFeO4 cell material, safety performance, and long cycle life.
- Smart BMS protection functions: over-discharge, high temperature, over-charge, over-current.
- Flexible configuration, multiple battery modules can be operating in parallel for expanding capacity and power.
- Working temperature range is from 0°C to 50°C with excellent discharge performance and cycle life.
- Small size and lightweight: up to the standard of the 19-inch embedded designed module are comfortable for installation and maintenance.

2.2 Package Contents

The packaging is recyclable, save it for reuse or dispose of it properly



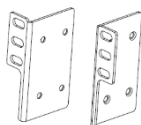
Module(x1)



Manual(x1)



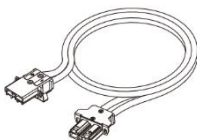
Quick Installation Guide(x1)



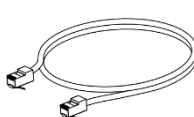
Ear Kit(x1)



Screws(x8)



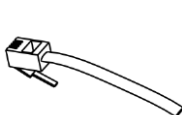
Battery cable(x1)



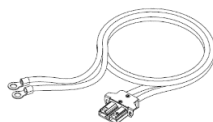
RJ45 cable (x1)



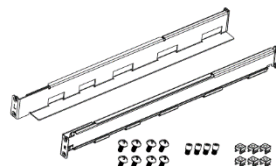
RJ11 cable(x1)



Signal cable (x1)



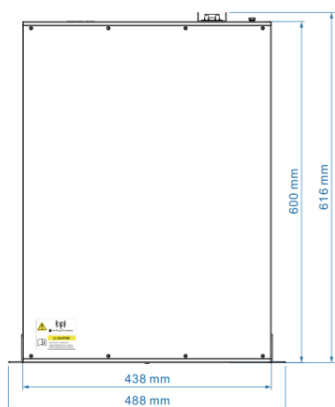
*Optional: Battery cable (x 1)



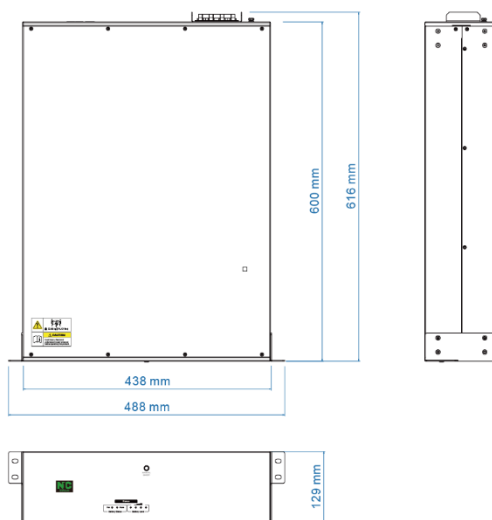
Rail Slide Kit

*Can be purchased separately.

2.3 Dimensions



N1C.L4850EBM2U

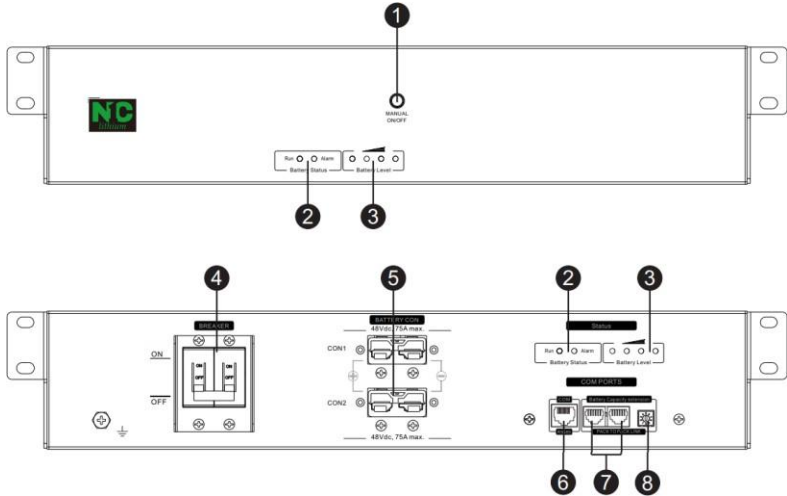


N1C.L48100EBM3U

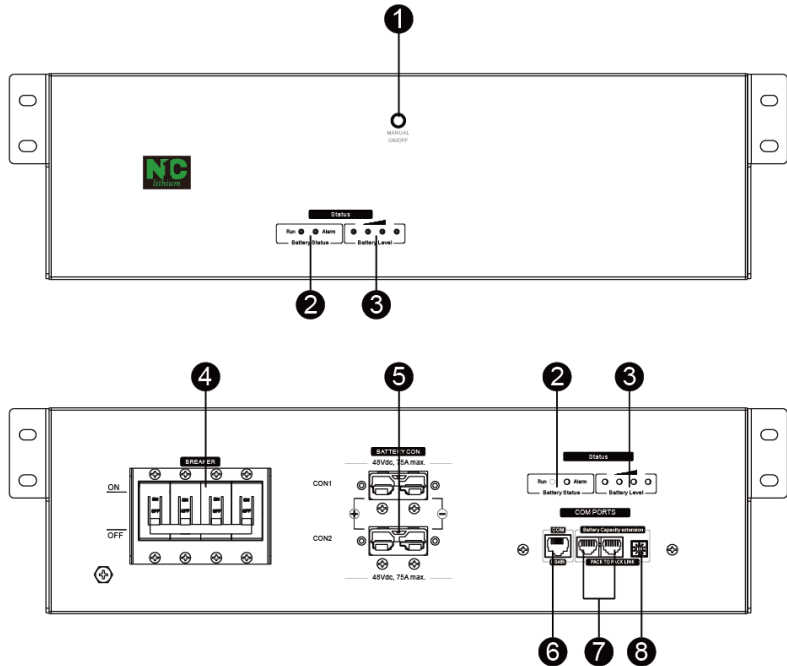
2.4 Specifications

Model	N1C.L4850EBM2U	N1C.L48100EBM3U
Nominal Voltage	48 VDC	48 VDC
Total Capacity	50 Ah	100 Ah
Nominal Capacity (Wh)	2400 Wh	4800 Wh
Full Charge Voltage (FC)	52.5 V	52.5 V
Full Discharge Voltage (FD)	34.5 V	34.5 V
Max. Continuous DischargeCurrent	75 A	75 A
Max. Peak DischargeCurrent	100 A	100 A
Max. Current on BatteryConnector	75A	75A
Protection	BMS, Breaker	
Max. Charge Voltage	52.5 V \pm 0.1 V	
Max. Charge Current	50 A (1C)	
Standard Charge Method	0.2C CC (Constant Current) chare to FC,CV (Constant Voltage) charge till chargecurrent decline to <0.05C	
Inner Resistance	< 20m ohm	
Storage Temperature	-20°C~25°C <18 months Max. 80%RH 25°C~45°C <3 months Max. 80%RH 45°C~60°C <1 month Max. 80%RH 20°C \pm 5 °C is the recommended storagetemperature	
Dimension (D x W x H)	616 x 488 x 86 mm 24.25 x 19.21 x 3.39 in	616 x 488 x 129 mm 24.25 x 19.21 x 5.08 in
Net Weight	28.1 kg 61.95 lb	48.1 kg 106.04 lb
Operation Temperature	Charge : 0°C ~ 50 °C Discharge : 0°C ~ 50 °C	
Communication	RS485 (RJ45), extension port (RJ11)	
Certifications	UL1973, UN38.3, IEC 62619	
Design Life	>10 years @ 25 °C	
Lifecycle	> 2000 @ 25 °C	

2.5 Product Indicator & Setting



N1C.L4850EBM2U front and rear panel



N1C.L48100EBM3U front and rear panel

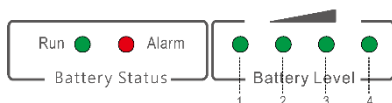
1 Manual power on/off button - to wake up or shut down the battery module.

- If battery module is off, press and hold the button for approximately 5 seconds to turn on the module.
- If battery module is working, press and hold the button for approximately 3 seconds to shut down the module.



2 Battery Status LEDs - Indicates battery module status. Please refer to the LED indicator table for the details.

3 Battery Level LEDs - Indicates battery level. Please refer to the LED indicator table for the details.

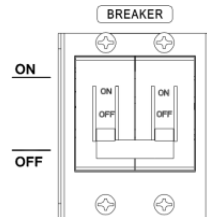
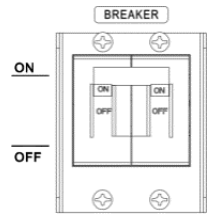
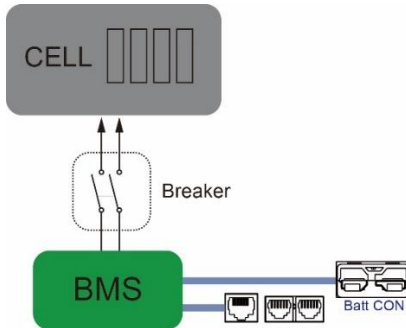


LED Indicator:

Battery Status			Battery Status LEDs		Battery Level LEDs			
Status		SOC	RUN ●	●ALARM	LED1	LED2	LED3	LED4
Normal Mode	Charging	0%~25%	ON●	OFF	Flash	OFF	OFF	OFF
		26%~50%	ON●	OFF	ON●	Flash	OFF	OFF
		51%~75%	ON●	OFF	ON●	ON	Flash	OFF
		76%~100%	ON●	OFF	ON●	ON	ON	Flash
	Discharging	0%~25%	ON●	OFF	ON●	OFF	OFF	OFF
		26%~50%	ON●	OFF	ON●	ON	OFF	OFF
		51%~75%	ON●	OFF	ON●	ON	ON	OFF
		76%~100%	ON●	OFF	ON●	ON	ON	ON
Alarm mode	Warning	-	OFF	Flash	-			
	Fault	-	OFF	On	-			
Power Off		-	OFF	OFF	OFF	OFF	OFF	OFF

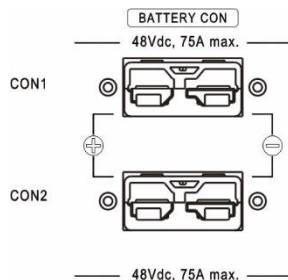
4 Breaker

- Turn the breaker ON: Connect cells to BMS
- Turn the breaker OFF: Shut down energy between Cells and BMS



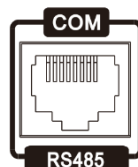
5 External Battery Connector

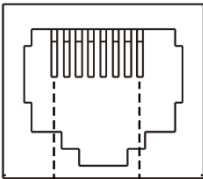
- (1). CON1 & CON2 in parallel.
- (2). "Positive" marked in "+",
"Negative" marked in "-"



6 COM Port

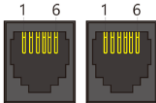
- Connector type: RJ45
- Function: communication between battery module and power module.
- Pin Definition



	PIN		Definition
	1	2	
	1	2	RS485B
	2	3	RS485A
	3	4	NC2
	4	5	RS485B
	5	6	RS485A
	6	7	PresentA
	7	8	PresentB
	8		NC1

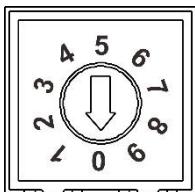
7 Extension Port

- Connector type: RJ11
- Function:
 1. For battery capacity extension by parallel
 2. BMS signal transmission
- Pin Definition

	PIN	Definition
	1	CANH
	2	CANL
	3	PresentA
	4	PresentB
	5	NC
	6	NC

8 ID Switch

- ID Switch indicates the unique ID code for each battery module. It's required to assign a unique ID to each battery module for normal operation.
- We can set up the ID code for each battery module by rotating the PIN number on the ID switch. From number 0 to 9, the number can be random; no particular order.
- If more than one battery module in the parallel system, the battery pack connected to the power module is the Master battery and the ID code should be set as 0. The ID code of the remaining battery module MUST be unique. Not the same number for 2 battery modules in parallel system.
- Maximum 10 battery modules can be operated in parallel.

	PIN	Definition
	0	0x5B4
	1	0x5B3
	2	0x5B2
	3	0x5B1
	4	0x5B0
	5	0x5AF
	6	0x5AE
	7	0x5AD
	8	0x5AC
	9	0x5AB

3. Safe handling of lithium batteries guide

3.1 Product handling guidelines



<18 kg
<40 lb



18-32 kg
40-70 lb



32-55 kg
70-120 lb



>55 kg
>120 lb



3.2 Explanation of symbol



DANGER

**DANGER LOW DC VOLTAGE INSIDE
DANGER ARC FLASH & SHOCK HAZARD**

- Do not disconnect, disassemble or repair by yourself.
- Do not drop, deform, impact cut or spearing with a sharp object.
- Do not place near open flame or incinerate.
- Do not sit or put heavy things on battery.
- Keep away from moisture or liquid.
- Keep out of reach of children, animals or insects.

* Short circuit current rating: 300 A

* Maximum voltage: 55V



4. Installation

4.1 Installation Environment

Make sure that the installation environment meets the following conditions:

- The area is completely waterproof.
- The floor is flat and level.
- There are no flammable or explosive materials nearby.
- The ambient temperature is within the range of 0~50°C.
- The temperature and humidity are maintained at a constant level.
- There is minimal dust and dirt in the area.



Caution:

If the ambient temperature is out of the operating range, the battery module will stop operate to protect itself. The optimal temperature range for the battery module to operate is 0°C to 50°C. Frequent exposure to harsh temperatures may deteriorate the performance and shorten the life cycle of the battery module.

4.2 Installation

Before installation, please pay attention to the following actions to avoid damage.



Caution:

If there is breaker installed on the battery cable between power module and battery module, turn on this breaker before battery module is powered on. Otherwise, it may cause surge current.

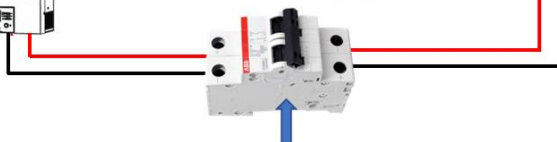
Power Module



Battery Module



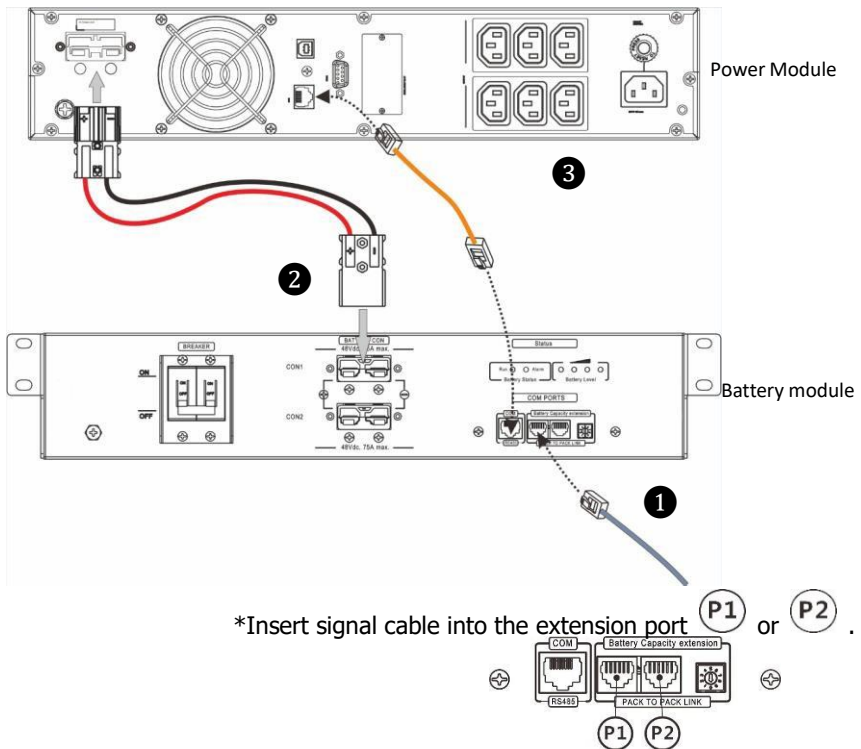
Breaker



Turn "ON" the breaker before battery module is powered on.

Single Battery Module Connection

1. Insert the supplied signal cable into the extension port (P1 or P2).
*It's requested to connect to the battery module for normal operation.
2. Use supplied battery cable to connect to power module via CON1 or CON2.
3. Insert the supplied RJ45 cable into the COM port on the battery module. The other end connects to BMS communication port on the power module.



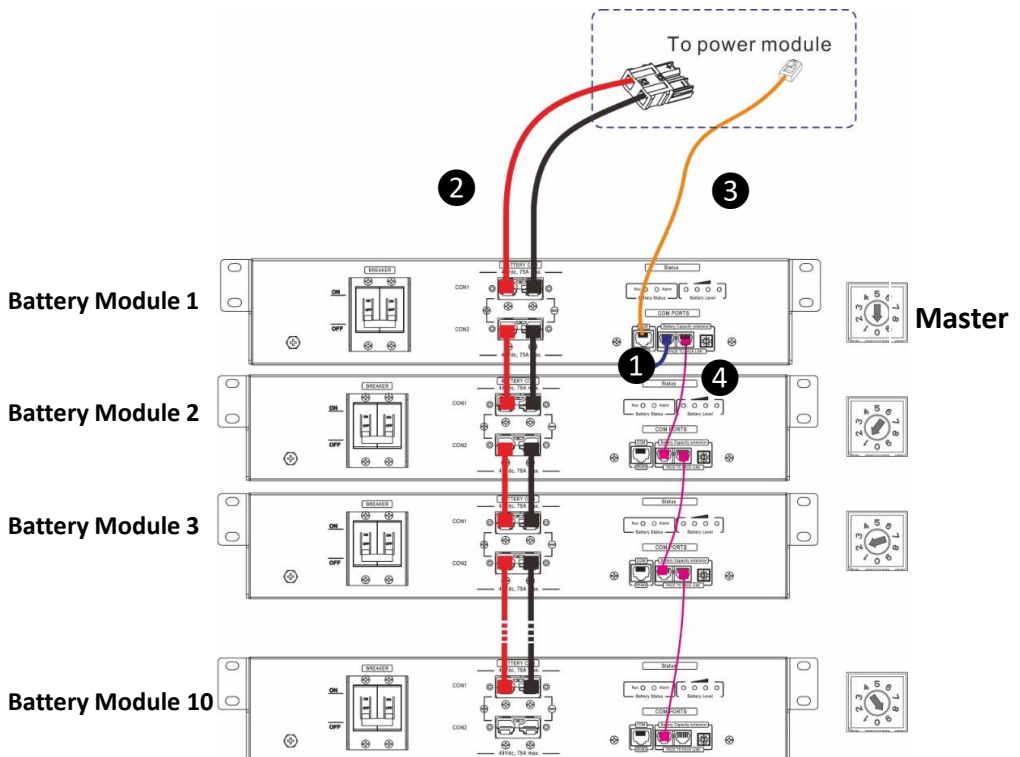
4. Turn the breaker switch "ON". Now, the battery module is ready for DC output.
5. Press manual ON/OFF button for 5 secs, the battery module will start up.

*If the manual button cannot be approached, just simply turn on the power module. The battery module will be automatically turned on.

Multiple Battery Modules in Parallel

1. Insert the supplied signal cable into the extension port (P1 or P2) on the Master battery module #1.
*It's requested to connect to the battery module for normal operation.
2. Use supplied battery cable to connect to power module via CON1 or CON2.
3. Insert the supplied RJ45 cable into the COM port on the battery module. The other end connects to BMS communication port on the power module.

Power module connecting with multiple battery modules for capacity extension:



*The battery module connected to the RS485 port on power module will be master battery module. Be sure to set ID of master battery as "0".

4. Insert supplied RJ11 cable to connect the extension port of the Master battery module #1. The other end connects to the extension port of the battery module #2.
5. Use supplied battery cable to connect to the Master battery module #1 and battery module #2.
6. If more battery modules to connect the system, repeat step 4 and 5 to connect more battery modules.
7. After connecting all battery modules, turn the breaker switch "ON" of each connected battery module. Now, the battery modules are ready for DC output.
8. Press manual ON/OFF button of each connected battery module for 5 secs. All battery modules will start up.

*If the manual button cannot be approached, just simply turn on the power module. The battery module will be automatically turned on.

5. Start-Up/Shut-Off the Battery Module

5.1 Start up the battery module

1. When battery module is in the shutdown mode, press manual ON/OFF button for 5 secs.
2. Or, simply turn on the the power module and connect battery module to operating power module. The battery module will be automatically turned on.



5.2 Shut-off the battery module

1. When battery module is in the operating mode, press manual ON/OFF button for 5 secs.
2. Or, if battery module is not operated (charge or discharge) for 10 hours, the battery module will automatically shut off.
3. Or, the battery module has no connection to the system (power module). After operates without any connection with the COM Port (RS-485) for 24 hours, the battery will shut-off automatically.
4. Or, the battery module is removed from the power module after 24 hours, the battery will shut-off automatically.
5. Or, when the cell voltage is lower than 2.3V/Cell for 10 minutes, the battery module will shut-off.

6. Trouble Shooting

Use the table below to solve minor installation and operation problems.

Symptom	Possible cause	Remedy
Battery cannot discharge.	Same ID code set in multiple battery packs.	Re-set each battery with different ID codes.
	Protection against under-voltage.	Charge battery.
	Protection against over-temperature or under-temperature (cell temperature is lower than -20°C or higher than 80°C).	Regulate cell temperature in the range of -20°C to 60°C for discharge.
	Protection against over current	Remove some non-critical load and charge battery.
	Battery output is short circuit	Relieve short circuit and charge battery
	System failure detected	Shut down system and call maintenance service
	In parallel battery packs, CAN communication lost and "parallel imbalance" occur on slave battery.	Ensure communication wires are all correctly connected well.
Battery cannot charge.	Protection against over current.	Ensure power shelf setting is not over 1C for battery.
	Protection against over-temperature or under-temperature (cell temperature is lower than 0°C or higher than 60°C)	Regulate cell temperature in the range of 0°C to 50°C for charge
	System failure detected	Shut down system and call maintenance service.
Communication failure is detected.	Communication cable	Check if communication cable is firmly connected.
	Communication address conflict	Check the parallel batteries address setting and correct them.
	System failure detected	Shut down system and call maintenance service.