DATOU BOSS

Version: 1.1.1

LiFePO4

51.2V 100AH LIFEPO4 BATTERY 3U MANUAL

Operation and Maintenance

(DT-3U-48100)

SUPPORT

If you are experiencing technical problems and cannot find a solution in this manual,please contact DATOU BOSS for further assistance.

- Email: Manager@xdatou.com
- The website:www.xdatou.com
- Phone/Wechat/Whatsapp/LINE:+8613783531376

Description

This manual describes in detail the requirements and procedures for safe installation and operation of DATOU BOSS lithium battery pack. Please read this manual carefully. Only qualified persons are allowed to install, operate and maintain the system, otherwise it may cause product damage or personal safety risks.

Any actions against safety operation, or do not follow rules of this manual and limited warranty letter, will void warranty and qualification of this product. Meanwhile, the manufacturer will be not responsible for the product damage, property damage, personal injury or even death.

The information contained in this manual is accurate when it' s issued. DATOU BOSS reserves right to change specification (such as optimization, upgrade or other operations) without prior notice, and please always view the latest document via QR code on the label.

In addition, please noted that the diagrams/schematics in this document are used to help understand system configuration and installation instructions, which may be different from the actual items in the installation.

Contents

I.Information

1.1 Validity

This document is valid for: DT-3U-48V 100A-A

1.2 Target Group

This document is intended for qualified persons and operators. Only qualified persons are allowed to perform activities marked with a warning symbol and the caption“Qualified person" in this document. Qualified persons must have the following skills:

* Knowledge of how lithium iron phosphate batteries work and are operated.

* Knowledge of how an energy storage system (including PV/battery/hybrid inverter, MPPT, Meter,Distribution box etc.) works and is operated.

* Knowledge of local applicable connection requirements, standards, and directives.

* Training in the installation and commissioning of electrical devices and batteries.

* Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and batteries.

1.3 Levels of warning messages

The following levels of warning messages may occur when handling the product.

DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or product permanent damage.

NOTICE
Indicates a situation which, if not avoided, can result in property damage or product not working or accelerated product damage.

1.4 Symbol Description

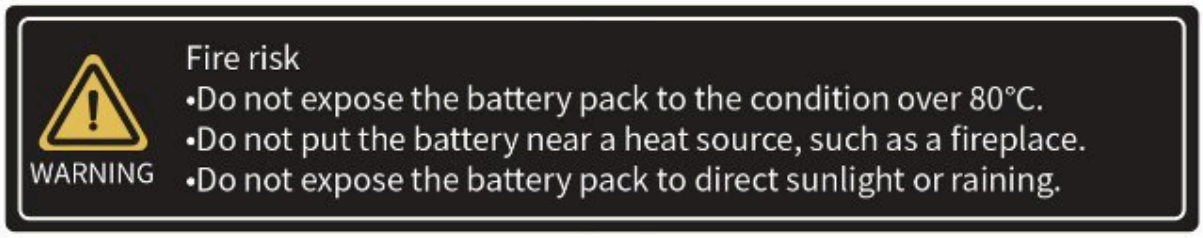
Symbols	Definition
	Indicates the danger of electric shock. If not avoided, it would cause casualities.
	Indicates a potentially dangerous condition which could result in injury or death.
	Indicates important information or warnings related to concepts talked about in the text.
	Indicates more information is available in other documents relating to the subject and reader.
	Indicates important steps or tips for optimal performance.
	Do not place the battery within children/pet touchable area.
	Do not place the battery near heat source and flammable material.
	Do not expose the battery to direct sunlight, rain and snow.
	Do not short circuit the battery.
	Recycle label
	WEEE designation
Label	**Definition**
	Indicates activities that can only be performed by qualified persons
	Grounding point

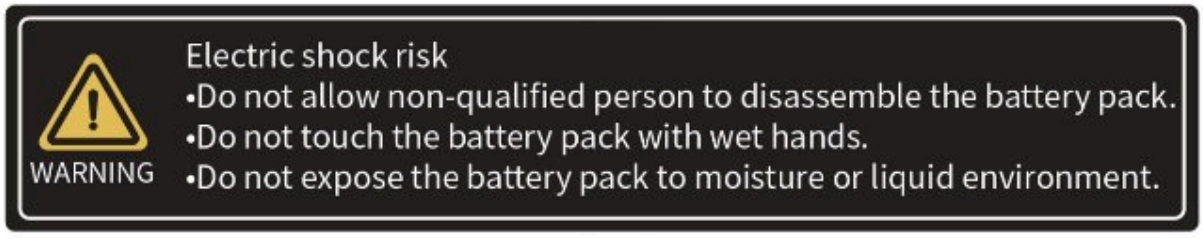
1.5 Abbreviation Description

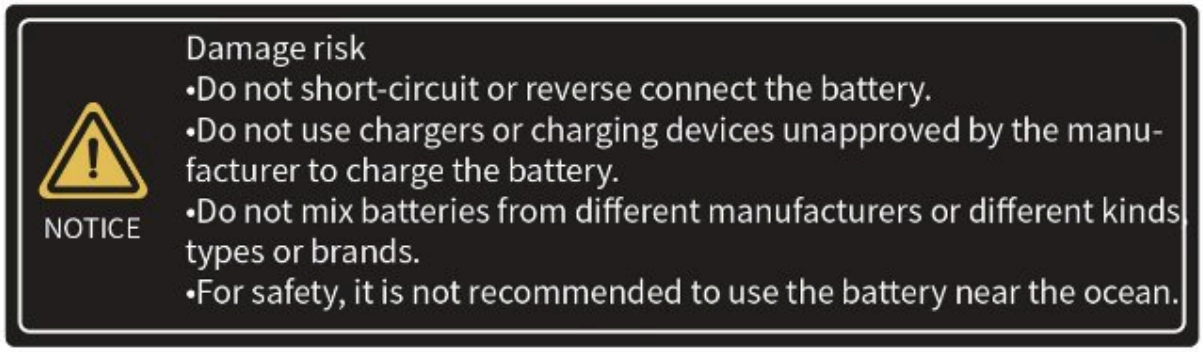
Abbreviation	Definition
Battery/battery pack/battery module	Single DT-3U-48V 100A-A rechargeable lithium iron phosphate battery pack including cells, BMS and enclosure etc.
Battery system/ cluster	Multiple DT-3U-48V 100A-A battery pack connected in parallel with power, communication and grounding cables and installation auxiliaries.
BMS	Battery management system Electronical Unit to ensure lithium cells' safety and display information or control the operation of the battery.
SOC	State of charge The battery state of charge refers to the percentage of the remaining capacity and rated capacity of the battery.
SOH	State of health The battery health status refers to the percentage between the full charged capacity and the rated capacity of the battery.
DIP switch	Used to set the address of the battery in the battery pack

II.Safety

2.1 Safety precautions







2.2 Safety instructions

The battery has been designed and tested in accordance with international (such as UL, IEC, UN38.3 etc.) safety requirements. However, due to various factors during the whole lifetime process, DATOU BOSS cannot guarantee absolute safety,in order to prevent personal and property damage and ensure long-term operation of the battery. Please do read and follow the section below carefully to operate the battery and handle emergency situations.

2.2.1 Safety gear

It is required to wear the following safety gear when installing and handling the battery pack.

Insulated gloves

Safety Glasses

Safety Shoes

2.2.2 Emergency safety measures

* Water invasion
Please cut off the AC power supply of the system first and then disconnect all switches under the premise of ensuring safety.

* Electrolyte or gas leakage
If the battery pack leaks electrolyte, avoid contacting with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

•Gas Inhalation: Evacuate the people from the contaminated area and seek medical aid immediately.

•Eye Contact: Flush your eye with clean and flowing water for 15 min, and then seek medical aid immediately.

•Skin Contact: Thoroughly rinse the exposed area with soap and water to be sure no chemical or soap is left on them, and seek medical aid immediately.

•Ingestion: Induce vomiting, and seek medical help immediately.

WARNING
In case of fire situations, please use carbon dioxide fire extinguisher rather than liquid to put out fires.

2.2.3 Other Tips

•All the product are strictly inspected before shipment.Please contact us for replacement if you notice there are any defectives such as swelling etc.

•Do not disassemble batteries and components, otherwise the manufacturer will not be responsible for any damage caused by unauthorized disassembly or repair.

•Enable the battery to be safely grounded before use to make sure the system in safe and normal operation.

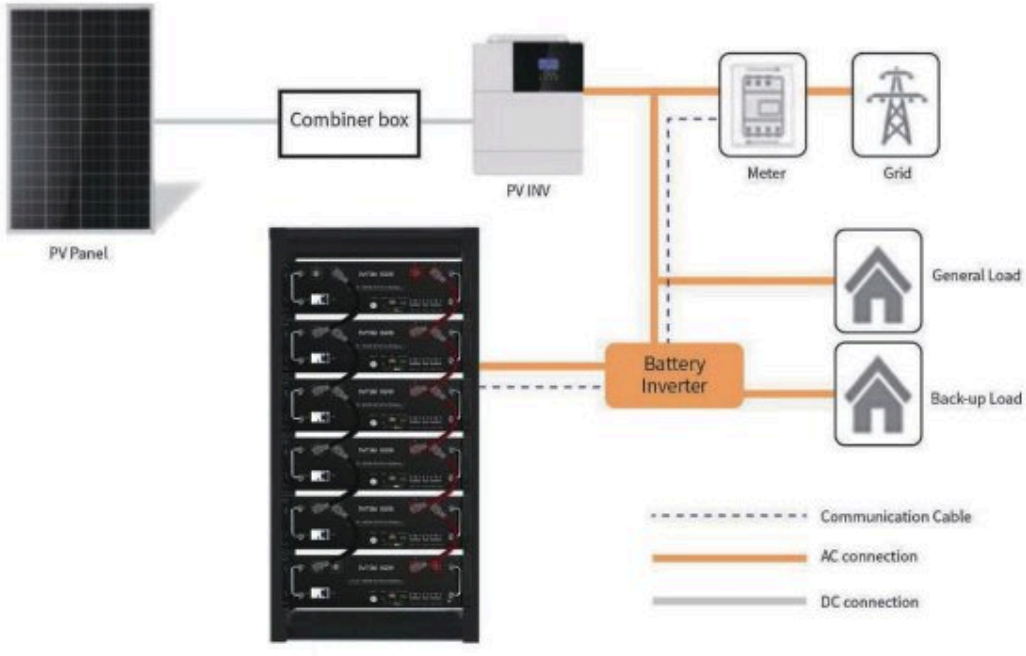
•Please ensure that the electric parameters of these devices are compatible mutually before connecting the battery to other devices.

•Please take the environmental factors into careful considerations to ensure that the system can work in a suitable condition as the environment and storage methods have a certain impact on the service life and reliability of this product.

III.Product Overview

3.1 Introduction

The **DATOU BOSS** battery is designed for residential application and works as a storage unit in the photovoltaic system. It is a 48V Li-ion battery storage system, with BMS inside itself. It could be operated in both on-grid, back-up and off-grid modes with compatible inverters. Below is the general schematic of an ac-coupled system.



CAUTION

This electrical connection in this diagram is only for illustration. Please follow the manual suggestions of related devices and operate in accordance with locally applicable connection requirements, standards, and directives.

3.2 Features

•With highest safety, battery is made from LiFePO4 chemistry and complies with highest international safety and transport standard.

•Modular and flexible, it can support up to 15 batteries connected together to expand the system energy.

•Built-in pre-charge circuit to avoid rush current when connecting with different inverters/chargers.

•Automatic dynamic addressing function when connecting multiple batteries together.

•It can support a maximum of 96% DOD under off-grid and back-up application.

•Built-in BMS provides warning and protection functions including over-discharging, over-charging, over- current, short-circuit and high/low temperature.

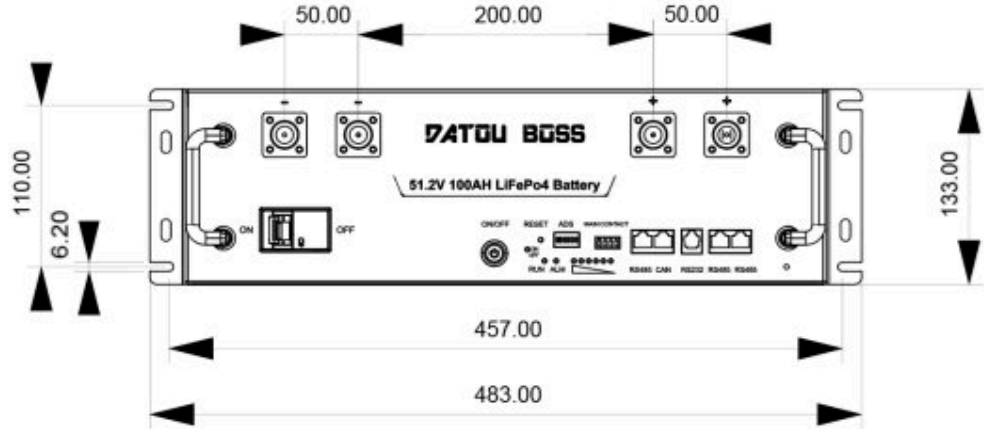
•LiFePO4 is equipped with automatic balancing function to meet long cycle life. New batteries need to go through multiple charge - cycles (approximately 10 times) to reach their maximum capacity.

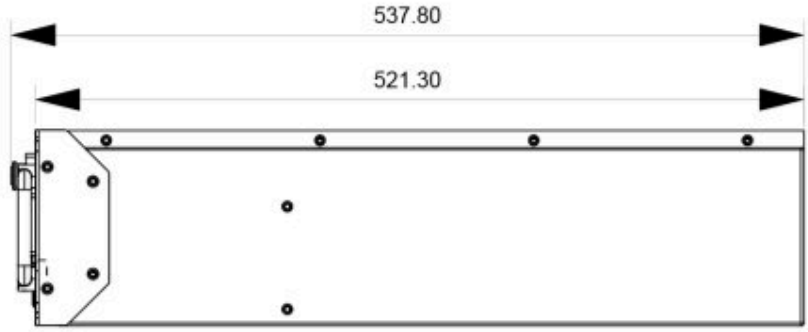
•Compact size and light weight for easy installation and maintenance.

•CAN/RS485 port for external communication.

3.3 Specification

3.3.1 Dimension





3.3.2 Parameters

Items	DT-3U-48100
Rated voltage	51.2V
Max. voltage range	40.5~54.75V
Charge voltage	58.4V
Low voltage cut-off	40.0V
Nominal energy	5.12kWh
Usable energy	5.12kWh
Nominal capacity	100Ah

Dimension	22.09*19.02*5.24in/56.1*48.3*13.3cm	
Weight	94.8lb/43kg	
Standard charge current	≤50A	
Max. charge current	100A	
Max. discharge current	100A(initial temp. ⩽35°C)	
Communication port	RS485 /CAN/RS232	
Max. parallel number	15pcs	
Operating temperature	Charge: 0~55°C	Discharge: -20~55°C
Storage temperature	-20~25°C	Less than 1 year
	20~40°C	less than 3 months
	Environment at the shipment state	60±25%R.H.

BMS Parameters			
Charge	Spec	Delay	Recovery
Cell Voltage Protection	3600mV	3000mS	3400mV
Module Voltage Protection	58.4V	3000mS	54.4V
Charge Over Current 1	105A	2000mS	
Charge Over Current 2	120A	2000mS	
Temperature Protection	<32°F/0°C or >149°F/65°C		

Discharge	Spec	Delay	Recovery
Cell Voltage Protection	2500mV	3000mS	3000mV
Module Voltage Protection	40.0V	3000mS	48.0V
Discharge Over Current 1	105A	2000mS	
Discharge Over Current 2	120A	2000mS	
Short Circuit	1200A	400uS	
Temperature Protection	<-4°F/-20°C or >149°F/65°C		

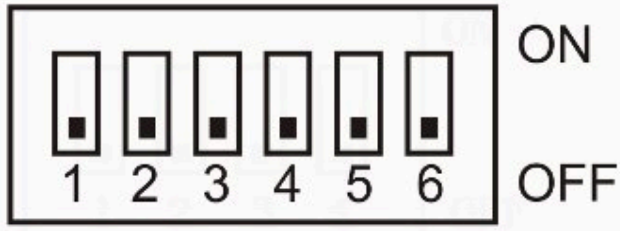
BMS	Parameter		Condition
PCB Temperature Protection	>221°F/105°C		
Cell Balance	60mV charging equalization		
Temperature Accuracy	±3°C		
Cell Voltage Accuracy	±10mV		For Cells
Current Accuracy	±2%		
SOC	5%		
Power Consumption	Off Mode	≤20uA	Storage/Transport
	Sleep Mode	≤200uA	Sleeping
	Operating Mode	≤60mA	Charging/Discharging
Communication Ports	RS485、CAN、RS232		
Bluetooth&Wifi Signal Distance	≥49 feet/15m		

The optimum operating temperature range is from 15°C to 30°C. Frequent exposure to the harsh temperatures may worsen the performance of the battery pack and its cycle life.

3.3.3 Panel Interface

NO.	Items	Usage description	Remark
A	Handles	For handling, intallation and disasembly of battery	
B	Grounding	Used to connect battery with ground	
C	Negative terminal	Used to connect the inverter/charger	
D	Positive terminal	Used to connect the inverter/charger	
E	125A breaker	Over-current protection	
F	Power switch	Used to Power on/off battery	
G	ON/OFF indicator	Indicates whether the battery is turned on or off	
H	Reset	Used to reset the BMS	
I	ADS	Used to set the address of the battery in the battery pack	
J	RUN	Used to show battery is in running status when lighting or flashing	
K	ALM	Used to show battery Alarm/ Protection status	
L	Dry contact	2 channels output signal 1 channel input signal	Pin1 on the left
M	SOC	Used to show battery real-time SOC	
N	RS485-1	Connect to host computer/inverter	
O	CAN	Connect to inverter	
P	RS232	Connect to host computer/inverter	
Q	RS485 IN RS485 OUT	For communication between batteries	
R	Mounting ear	Used to fix with rack	

3.3.3.1 : ADS



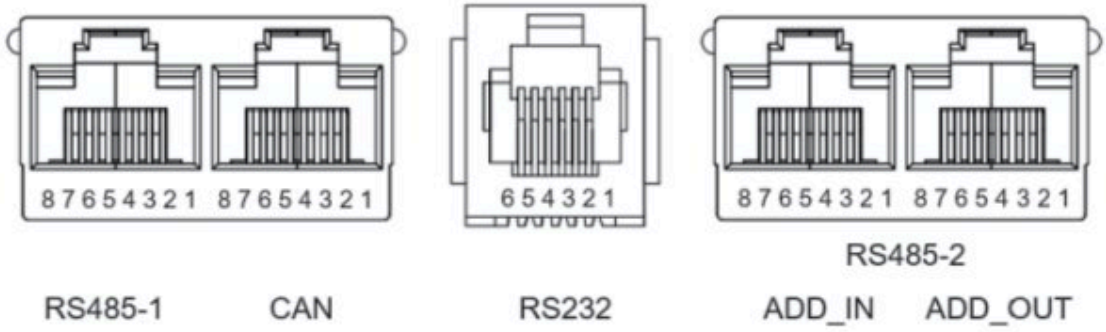
When PACK is used in parallel, the manual DIP address function is enabled when all DIP switches are dialed to OFF. Otherwise, use the default automatic addressing function. Use the DIP switch on the BMS to set the address to distinguish different packs.

地址位(二进制) Address bit (binary)	Explain						
	6	5	4	3	2	1	
0001(1)	NC	NC	OFF	OFF	OFF	ON	PACK1 (Set PACK1 to be used by a host)
0010(2)	NC	NC	OFF	OFF	ON	OFF	PACK2 (Set PACK2)
0011(3)	NC	NC	OFF	OFF	ON	ON	PACK3 (Set PACK3)
0100(4)	NC	NC	OFF	ON	OFF	OFF	PACK4 (Set PACK4)
0101(5)	NC	NC	OFF	ON	OFF	ON	PACK5 (Set PACK5)
0110(6)	NC	NC	OFF	ON	ON	OFF	PACK6 (Set PACK6)
0111(7)	NC	NC	OFF	ON	ON	ON	PACK7 (Set PACK7)
1000(8)	NC	NC	ON	OFF	OFF	OFF	PACK8 (Set PACK8)
1001(9)	NC	NC	ON	OFF	OFF	ON	PACK9 (Set PACK9)
1010(10)	NC	NC	ON	OFF	ON	OFF	PACK10 (Set PACK10)
1011(11)	NC	NC	ON	OFF	ON	ON	PACK11 (Set PACK11)
1100(12)	NC	NC	ON	ON	OFF	OFF	PACK12 (Set PACK12)
1101(13)	NC	NC	ON	ON	OFF	ON	PACK13 (Set PACK13)
1110(14)	NC	NC	ON	ON	ON	OFF	PACK14 (Set PACK14)
1111(15)	NC	NC	ON	ON	ON	ON	PACK15 (Set PACK15)

NOTICE

Failure to follow the DIP switch setting will cause the communication fault between battery and inverter. For detailed settings with different inverter/charger, please contact your supplier or ECO-WORTHY for consultation.

3.3.3.2 Communication Interface Pin Diagram



Communication Port	RS485-1		CAN		RS232		RS485-2*2	
Functional Description	Connect to host computer/inverter		Connect to host computer/inverter		Connect to host computer		Parallel communication*2	
Pin Description	PIN	Description	PIN	Description	PIN	Description	PIN	Description
	1,8	RS485-B1	1,8	NC	1,2,6	NC	1,8	RS485-B2
	2,7	RS485-A1	2,7	NC	3	TX	2,7	RS485-A2
	4	NC	4	CANH1	4	RX	4,5	NC
	5	NC	5	CANL1	5	GND	3	IN(L)/OUT(R)
	3,6	GND	3,6	GND			6	GND

The communication protocols/devices/software supported by each ports

PORT	RS485-1	CAN	RS232
USAGE	Connect to the inverter or upper computer	Connect to the inverter	Connect to the upper computer
SUPPORT	PYLON-LV RS485 V3.5 2019/08/07 (9600)	Pylon-CAN-V1.2-180408-lowVoltage	JBD-UP
	Growatt BMS-V1.09(1) -20201022	Growatt BMS CAN-Bus-protocol-low-voltage-V1.04	Solar Assistant
	VOLTRONIC-485-V1.0.3-200325	Victron-CAN-V1.00-210107	Overkill
	LXP-485-V1.0.0-210625	Luxpowertek Battery CAN Protocol-V1.0-20200211	
	Deye-485 Modbus Protocol(4)-deye -V1.30-20160801	SMA-CAN-V1.0.0-210630-FSS-ConnectingBat-TI-en-20W	
	SRNE_WOW_PACE_BMS_Modbus_Protocol_for_RS485_V1.3(2020-11-24)	Sofar-CAN-V1.00-211117-Rev6	
		PV1800F-CAN communication Protocol1.04.04	
		SRNE_WOW_BMS_Modbus_Protocol_for_CAN_V1.0	
		DEYE CAN-V1.0-20220402	
		MREGAREVO-Hybrid Inverter Communication Protocol With BMS	

3.3.3.3 Parallel Wiring Instructions

NOTICE

Automatic coding method wiring: After wiring is completed, the main unit must be the last one to be turned on.

3.3.3.4 LED Description

LED Indicator Light Description

State of system	Event	MOS (LED9)	Run (LED8)	Alarm (LED7)	SOC(LED6~1) LED6	LED5	LED4	LED3	LED2	LED1	Description
		●	●	●	●	●	●	●	●	●	
(Power off)	(Sleep)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	(All LEDs turn off)
static state	(Normal)	OFF	Flash1	OFF	Refer to table(4-11-2)						/
	(Alarm)	OFF	Flash1	Flash3							/
Charging	(Normal)	OFF	ON	OFF							/
	(Alarm)	OFF	ON	Flash3							The over voltage alarm does not flash
	(OV protect)	ON	ON	OFF	ON	ON	ON	ON	ON	ON	/
	(Temperature, Over-current, fail-safe)	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	/
Discharging	(Normal)	OFF	Flash 3	OFF	Refer to table(4-11-2)						
	(Alarm)	OFF	Flash 3	Flash 3							
	(UV protect)	ON	Flash2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/
	(Over-current, short circuit, temperature, fail-safe)	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	/

Important Notes:

1.Alarm: The ALM light alerts you to issues that may limit the inverter's charging or discharging current.

2.Standby Warning: The warning state in standby mode is triggered first by an alarm, then the device enters standby mode.

SOC Indicator Status (Battery Level)

(State)			(Charging)					(Discharging)					
LED		LED6 ●	LED5 ●	LED4 ●	LED3 ●	LED2 ●	LED1 ●	LED6 ●	LED5 ●	LED4 ●	LED3 ●	LED2 ●	LED1 ●
SOC(%)	0~16.6%	OFF	OFF	OFF	OFF	OFF	Flash2	OFF	OFF	OFF	OFF	OFF	ON
	16.6~33.2%	OFF	OFF	OFF	OFF	Flash2	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2~49.8%	OFF	OFF	OFF	Flash2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8~66.4%	OFF	OFF	Flash2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4~83.0%	OFF	Flash2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	83.0~100%	Flash2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
RUN LED●		ON						Flash 3					

LED flash description

(Flash Mode)	(ON)	(OFF)
Flash1	0.25S	3.75S
Flash2	0.5S	0.5S
Flash3	0.5S	1.5S

3.4 Protection

Items	Description	Remark
Charge End Cell/ PACK high-voltage	The BMS will stop charging if any cell or PACK voltage reaches the protection value and it will be auto-released only when both Pack and cel voltage back to the release voltage range or there is efficient discharge current.	
Discharge End Cell/ PACK low-voltage	The BMS wil stop discharging if any cell or PACK voltage is under the protection value and it will be released only when al the cell voltage back to the release voltage range or there is efficient charge current.	It can automatically recover. Please charge timely, otherwise it may be in Low-power mode to be over-discharged.
High temperature	The BMS will halt charging, discharging, or both if any cell, environment, or MOSFET temperature falls outside the acceptable range.	Automatic recovery
Low temperature	The BMS will stop charging or discharging or both if any cell/environment/MOS temperature is under the range.	Automatic recovery
Charge over-current	The BMS will stop charging when the charging current is higher than the protection value. And it will release from the protection when the system delays time is met.	It can automatically recover. If locked after three consecutive times, manual intervention is required.
Discharge over- current/ Overload	The BMS wil stop discharging when the discharging current is higher than the protection value. And it will release from the protection when the system delays time is met.	Automatic recovery. If locked after three consecutive times, manual intervention is required.
Short-circuit/ Reversed	Short-circuit and Reversed polarity protection happened	Charge to release Manual reset
Temperature, Voltage Current sensor failure	When entering the failure mode, manual intervention is required; no charging and discharging	Manual intervention
Dormancy mode	After reaching a certain condition, it will be in the dormancy mode.	Recoverable