



# USER MANUAL

## LVTS-512100

### 5KWH LiFePO<sub>4</sub> Battery

## Contents

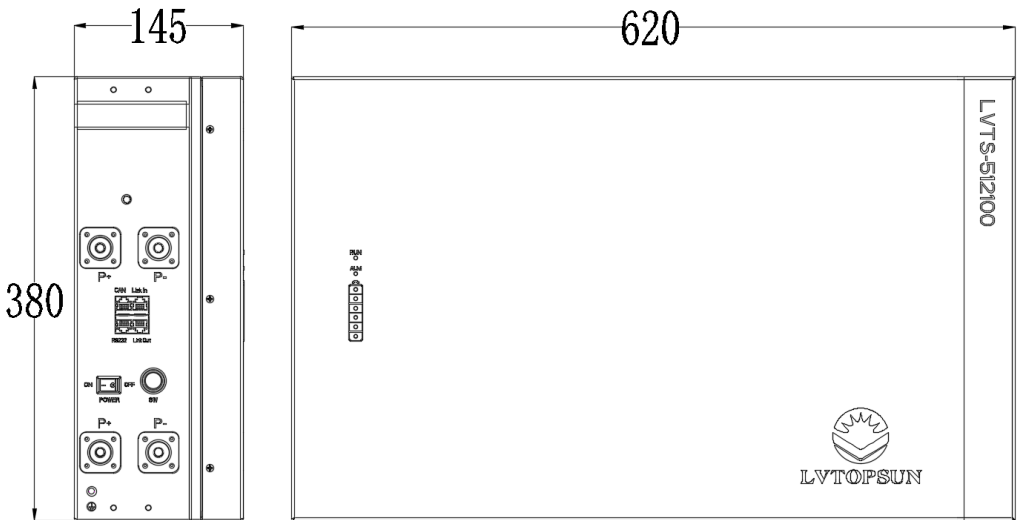
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# 1 Product Overview

LVTS-512100 5KWH is a 51.2V 100Ah stackable LiFePO<sub>4</sub> battery that can be floor mounted or wall mounted.

**LVTS-512100 5KWH is not suitable for life-sustaining medical devices.**

## 1.1 Appearance



## 1.2 Button, LED & Communication Port

### 1.2.1 Switch ON/OFF

#### 1、Switch ON

For single LVTS-512100 5KWH, switch ON POWER button, then long press (3 sec) SW button. For multiple LVTS-512100 5KWH connected in parallel, switch ON POWER buttons of all batteries, then long press (3 sec) SW button of master battery.

#### 2、Switch OFF

Switch OFF all POWER button(s).

### 1.2.2 LED Indicator Definition

Note: Flash 1 - 0.25s ON / 3.75s OFF

Flash 2 - 0.5s ON / 0.5s OFF

Flash 3 - 0.5s ON / 1.5s OFF

#### SOC Status while charging

STATUS		CHARGE							
		L8 ●	L7 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
SOC (%)	0~17	ON	OFF	OFF	OFF	OFF	OFF	OFF	Flash 2
	18~33			OFF	OFF	OFF	OFF	Flash 2	ON
	34~50			OFF	OFF	OFF	Flash 2	ON	ON
	51~66			OFF	OFF	Flash 2	ON	ON	ON
	67~83			OFF	Flash 2	ON	ON	ON	ON
	84~100			Flash 2	ON	ON	ON	ON	ON

**SOC Status while discharging**

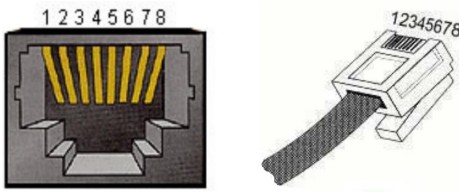
STATUS		DISCHARGE							
		L8 ●	L7 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
SOC (%)	0~17	Flash 3	OFF	OFF	OFF	OFF	OFF	OFF	ON
	18~33			OFF	OFF	OFF	OFF	ON	ON
	34~50			OFF	OFF	OFF	ON	ON	ON
	51~66			OFF	OFF	ON	ON	ON	ON
	67~83			OFF	ON	ON	ON	ON	ON
	84~100			ON	ON	ON	ON	ON	ON

**Work Status**

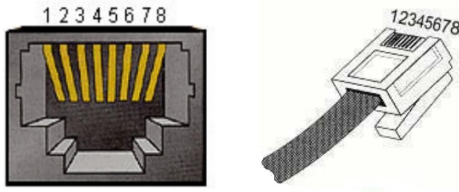
STATUS		RUN	ALM	SOC						DESCRIPTION
		L8 ●	L7 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	
Shutdown		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
Standby		Flash 1	OFF	According to SOC						
Charge	Normal	ON	OFF	According to SOC						
	Over volt	ON	OFF	ON	ON	ON	ON	ON	ON	Switch to standby mode
	Protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	Flash 3	OFF	According to SOC						
	Under volt	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Faulty		OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging and discharging

## 1.2.3 Communication Port Pin Definition

### 1.2.3.1 CAN/RS485 to PCS

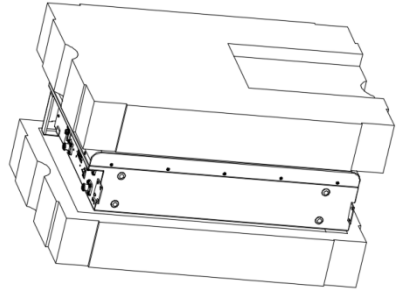
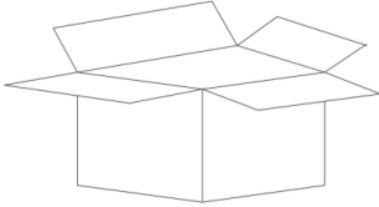
Port definitions	RJ45 Pin	Function
	1	RS485-B
	2	RS485-A
	3	GND
	4	CAN-H
	5	CAN-L
	6	NC
	7	RS485-A
	8	RS485-B

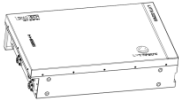






### 1.2.3.2 RS232 to PC

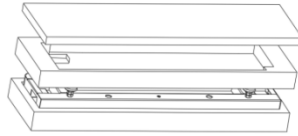
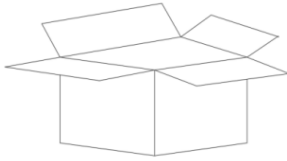
Port definitions	RJ45 Pin	Function
	1	RS232-TX
	2	GND
	3	RS232-RX
	4	NC
	5	NC
	6	NC
	7	NC
	8	NC





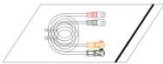
## 2 Installation Guide

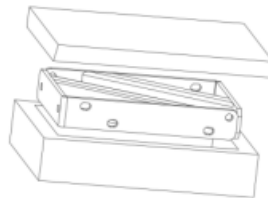
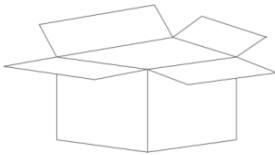
### 2.1 Checking Deliverables






NO.	Pictures	Quantity	Description
1		1 pc	Battery
2		2 pcs	Wall Connector
3		2 pcs	Wall Connector Bolt
4		2 pcs	Battery Connector
5		8 pcs	Battery Connector Bolt
6		2 pcs	Expansion Bolt
7		1 pc	Parallel Cable and PE wire



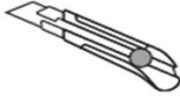

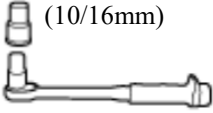



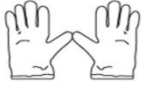


NO.	Pictures	Quantity	Description
1		1 pc	Floor Support
2		1 pc	Cable Holder
3		2 pcs	Cable Holder Bolt
4		1 pc	Comm cable
5		1 pc	Battery to PCS Cable



NO.	Pictures	Quantity	Description
1		2pcs	Wall Support (optional)
2		4pcs	Wall Support Bolt (optional)
3		8pcs	Expansion Bolt (optional)

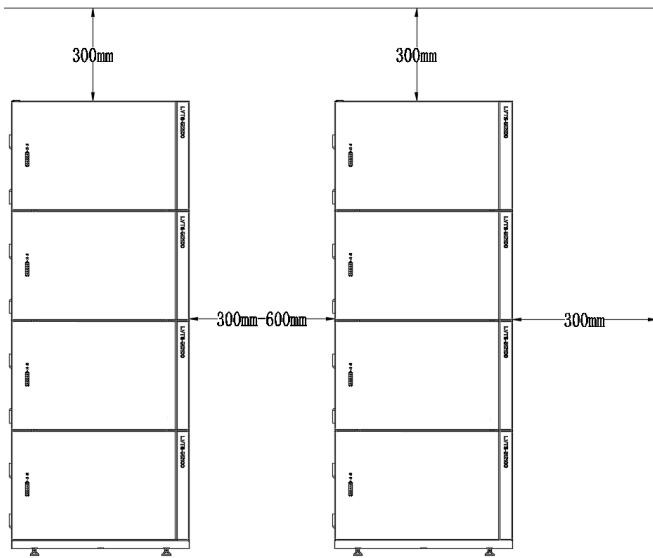


## 2.2 Tools

<b>Installation Tools</b>	Knife 	Measuring Tape 	Socket Wrench (10/16mm) 
	Hammer 	Cross Screwdriver 	Hammer Drill 
<b>Protection Tools</b>	ESD Gloves 	Safety Goggles 	Safety Shoes 

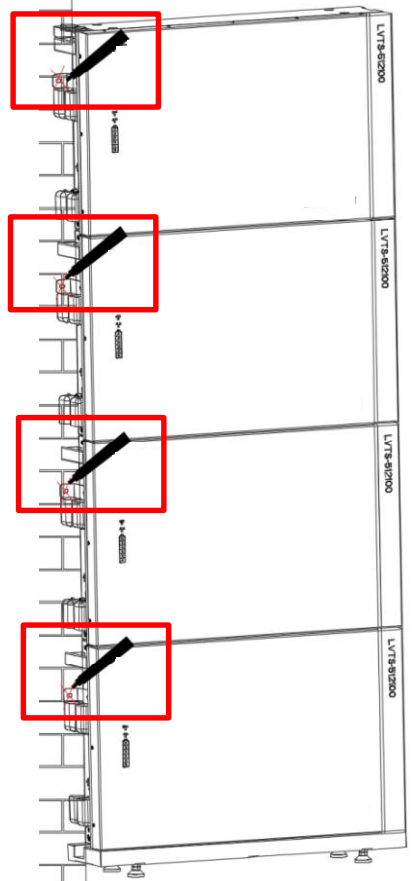
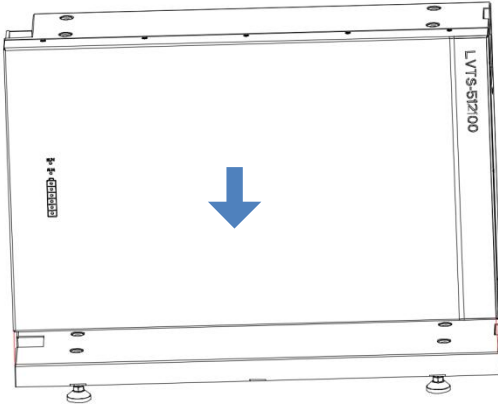
## 2.3 Installation Instructions (Floor Mounted)

Minimum mounting distance requirement:



**Step 1**

Install all LVTS-512100 5KWH batteries on floor support.



**Step 2**

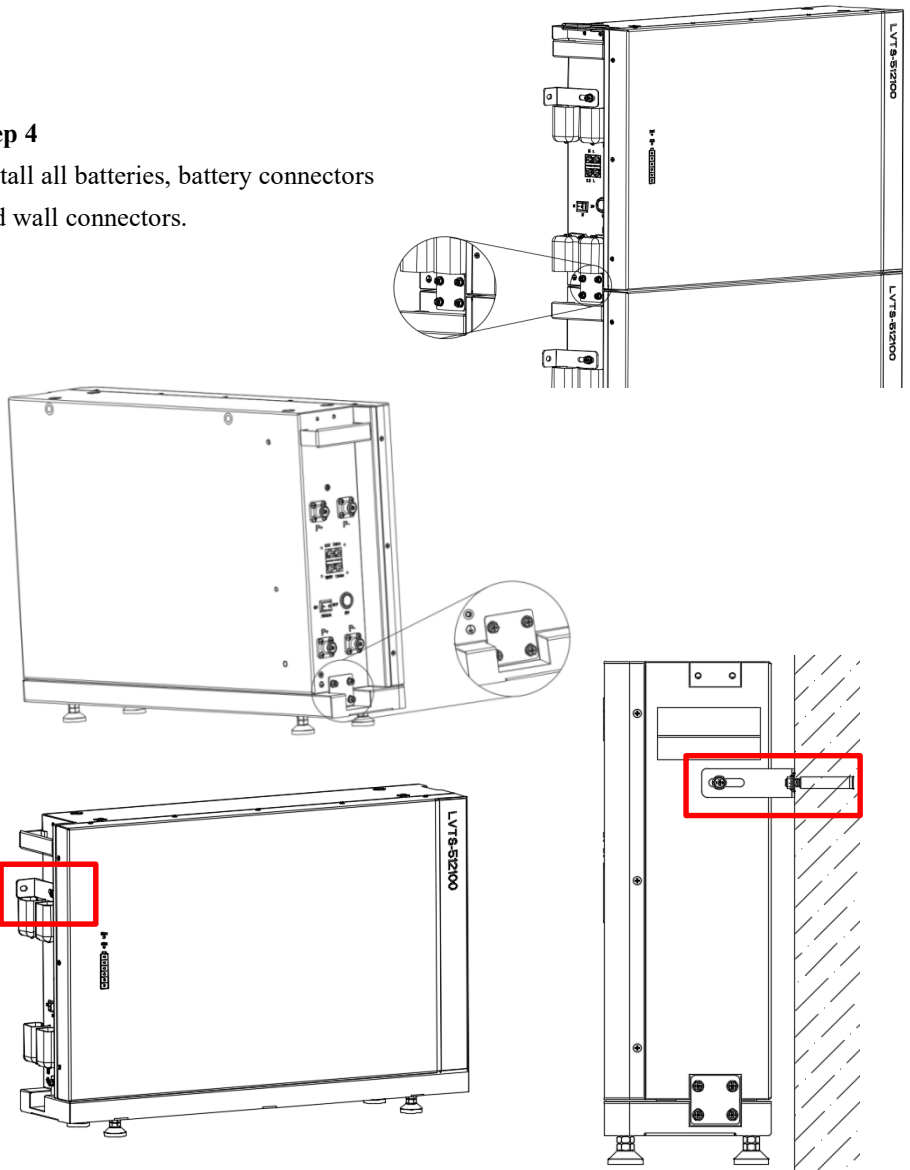
Install all wall connectors, use a marker pen to determine expansion bolt positions.

**Step 3**

Remove all batteries, drill holes and install expansion bolts.

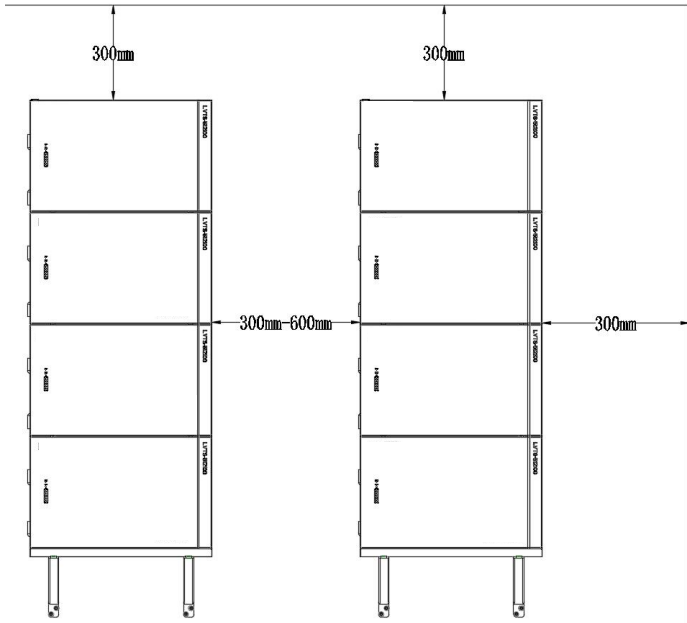
**Step 4**

Install all batteries, battery connectors and wall connectors.



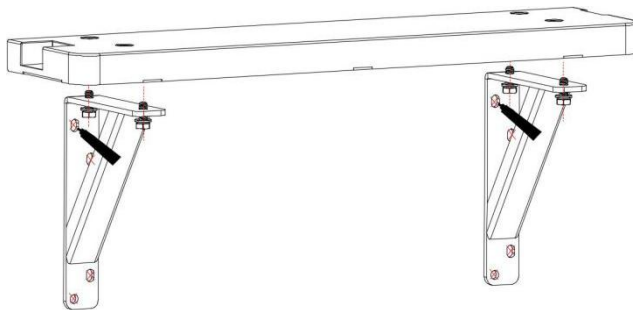
## 2.4 Installation Instructions (Wall Mounted)

**Minimum mounting distance requirement:**



### Step 1

Install wall support, use a marker pen to determine expansion bolt positions.

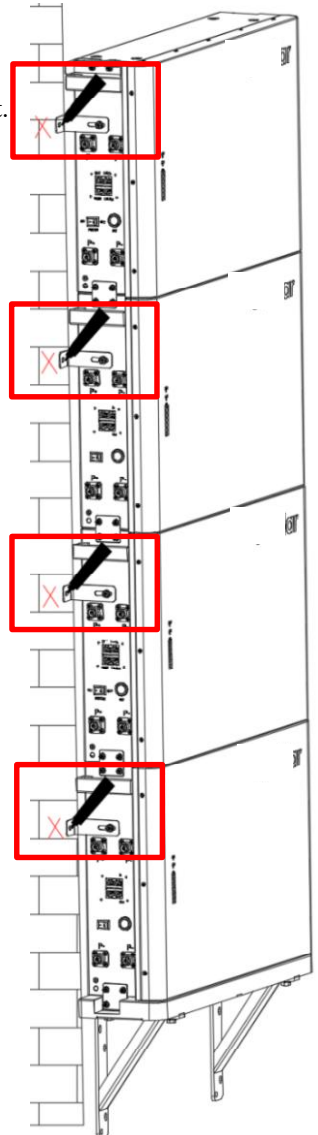
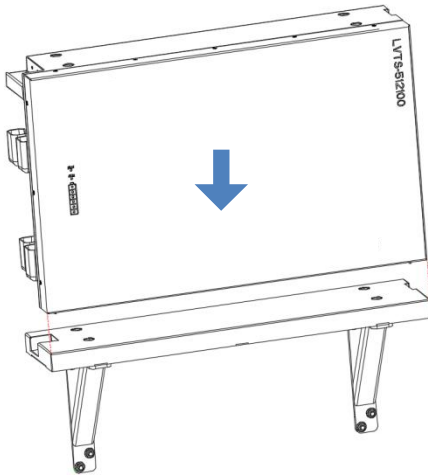


**Step 2**

Drill holes and install expansion bolts. Install wall support on the wall.

**Step 3**

Install all LVTS-512100 5KWH batteries on wall support.

**Step 4**

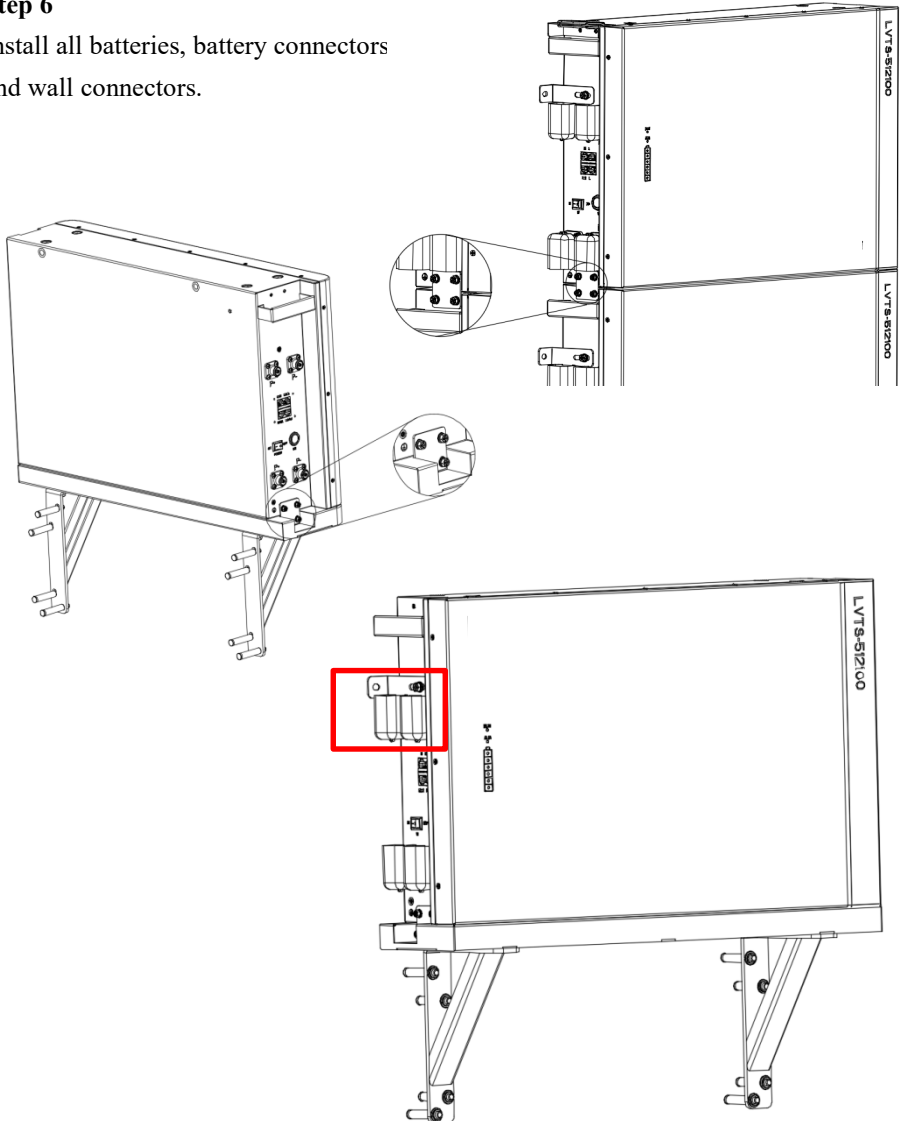
Install wall connectors, use a marker pen to determine expansion bolt positions.

**Step 5**

Remove all batteries, drill holes and install expansion bolts.

**Step 6**

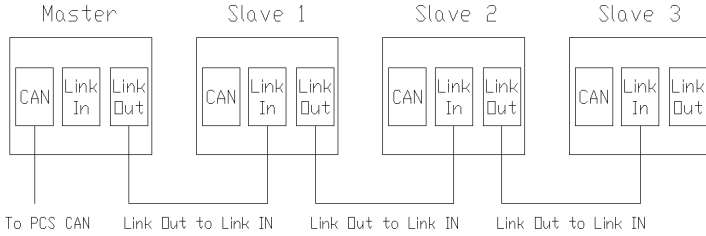
Install all batteries, battery connectors and wall connectors.



## 2.5 Cable Connections

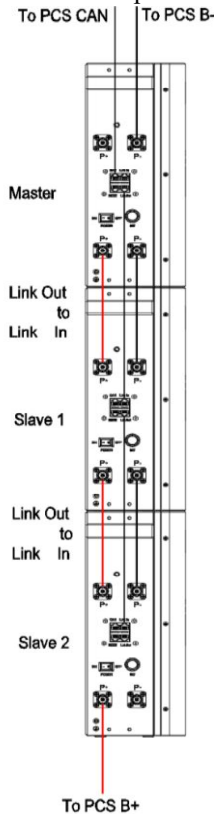
### Step 1

Connect communication cable.



### Step 2

Refer to the following diagram when multiple batteries are connected in parallel.



### 3 Technical Specifications

Basic Project		Parameter
Nominal Voltage		51.2V
Nominal Capacity		100Ah
Nominal Energy		5120Wh
Charge Voltage		56.16V
Charge Current		50A
Discharge Voltage Range		45.6V~56.16V
Discharge Current		100A
Communication Mode		CAN/RS485
Working Temperature	Charge	0℃~55℃
	Discharge	-20℃~55℃
Storage Temperature	Short Term (within 1 month)	-10℃~45℃
	Long Term (within 1 year)	0℃~35℃
Storage Humidity		<95% RH
Cell Type		LiFePO <sub>4</sub> , Lithium Iron Phosphate
Size		H380*W620*D145(mm)
Weight		44.8KG
IP Level		IP20



## 4 Maintenance

### 4.1 Recharge Requirements During Storage

Batteries should be stored in temperature between  $-10\text{ }^{\circ}\text{C} \sim +45\text{ }^{\circ}\text{C}$ , and recharged regularly according to the following table with 0.2C (20A) current to 50% SOC after long time storage.

**Recharge requirement during storage**

Storage Temperature	Storage Relative Humidity	Storage Time	SOC
Below $-10\text{ }^{\circ}\text{C}$	/	Not Allowed	/
$-10\sim 25\text{ }^{\circ}\text{C}$	5%~70%	$\leq 12$ months	$30\% \leq \text{SOC} \leq 60\%$
$25\sim 35\text{ }^{\circ}\text{C}$	5%~70%	$\leq 6$ months	$30\% \leq \text{SOC} \leq 60\%$
$35\sim 45\text{ }^{\circ}\text{C}$	5%~70%	$\leq 3$ months	$30\% \leq \text{SOC} \leq 60\%$
Above $45\text{ }^{\circ}\text{C}$	/	Not Allowed	/

### 4.2 Recharge Requirements When Over Discharged

Please recharge over discharged ( $>90\%$  DOD) batteries according to the following table, otherwise over discharged battery will be damaged.

**Recharge requirement when battery is over discharged**

Storage Temperature	Storage Time	Note
$-10\sim 25\text{ }^{\circ}\text{C}$	$\leq 15$ days	Battery disconnected from PCS
$25\sim 45\text{ }^{\circ}\text{C}$	$\leq 7$ days	
$-10\sim 45\text{ }^{\circ}\text{C}$	$< 12$ hours	Battery connected to PCS