Customer's Name：

Spec.No.：20200918-006
Item Coding：
Ver： A1
Date：2020-9-18

Foshan EnrSaver New Energy Technology Co., Ltd

Specification For Approval

Specifications： 24140160-16S4P-51.2V 200Ah

Wall mounted Model

Approval	Checked	Draft
Customer Approval		

Factory address： No 407, Building A8, Hantian Industrial City, Shenhai Road, Nanhai District, Foshan, Guangdong, China
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History of specification

Date	Contents	Remarks
2020-9-18	First edition	

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1. Scope

The specification shall be applied to LiFePO4 rechargeable battery pack Of 24140160-16S4P which is manufactured by Foshan EnrSaver New Energy Technology Co., Ltd.

2. Main specifications

2.1 Cell Battery specifications

	No.	Item	General Parameter		Remark
Lithium Battery Cell	1	Rated Capacity	Typical	50Ah	Standard discharge（0.2C_5A) after Standard charge
			Minimum	50Ah	
	2	Nominal Voltage	3.2V		Mean Operation Voltage
	3	Internal Impedance	≤0.65 mΩ		Internal resistance measured at AC 1KH_Z after 50% charge The measure must uses the new batteries that within one week after shipment and cycles less than 5 times
	4	Dimension	Thickness:Max 24.5mm		Initial Dimension
			Width：Max 140.5mm		
			Height：Max 160.5mm		
	5	Weight	1.15kg		APPROX
	6	Standard charge	Constant Current 0.33C_5A Constant Voltage 3.65V 0.02C_5A cut-off		Charge time : Approx3.5h
	7	Rapid Charge	Constant Current 1C_5A Constant Voltage 3.65V 0.01C_5A cut-off		Charge time : Approx1.5h@≧10℃
	8	Standard discharge	Constant current 0.33C_5A end voltage 2.5 V		16.5A
	9	Maximum discharge current	Constant current：2C_5A end voltage：2.5 V		100A@≧0℃
	10	Volumetric specific energy	295 WH/L		APPROX
	11	Gravimetric specific energy	139WH/KG		APPROX

2.2 Battery Pack specifications

	No.	Item	General Parameter		Remark
Lithium Battery Package	1	Combination method	16S4P		
	2	Rated Capacity	Typical	200Ah	Standard discharge after Standard charge（package)
			Minimum	196Ah	
	3	Factory Voltage	51V-53V(40-60%)		Mean Operation Voltage
	4	Voltage at end of Discharge	40-44V		Discharge Cut-off Voltage
	5	Charging Voltage	56-58V		
	6	Internal Impedance	≤60mΩ		Internal resistance measured at AC 1KHz after 50% charge The measure must uses the new batteries that within one week after shipment and cycles less than 5 times
	7	Standard charge	Constant Current40A Constant Voltage see No.5 0.02CA cut-off		Charge time : Approx 6 h
		Limiting current	20A		
	8	Standard discharge	Constant current：40A end voltage see NO.4		
	9	Maximum Continuous Charge Current	100A		T≥10°C
	10	Maximum Continuous Discharge Current	100A		T≥10°C
	11	Operation Temperature Range	Charge: 0~45℃		60±25%R.H. Bare Cell
			Discharge: -20~55℃		
	12	Storage Temperature Range	Less than 12 months : -10~35℃		60±25%R.H. at the shipment state
			less than 3 months: -10~45℃		
			Less than 7 day : -20~65℃		
	13	Dimensions	680*485*180 (220)mm		Include Bracket
	14	Weight	Approx ： 107kg		

3. Battery Management System Specification

3.1 BMS function introduction

1）：The BMS is designed for 15/16 series lithium battery.
2）：The BMS have all functions which are :
overcharge detection function
over discharge detection function
over current detection function
short detection function
Temperature detection function
balance function
communicate function
Alarm function
Total capacity function
Storage history function

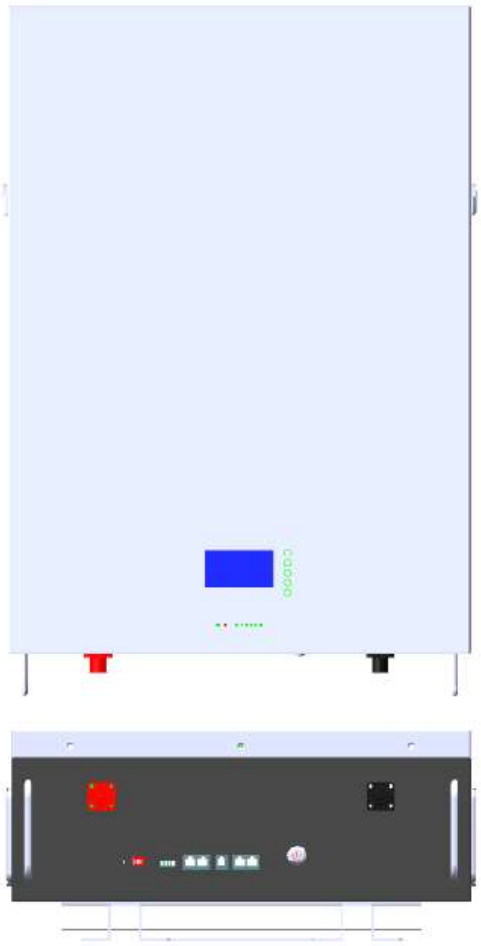
3.2 BMS Protect parameter

Items	Details	Standard
Cell overcharge protection	Overcharge detection voltage	3.65±0.025V
	Overcharge detection delay time	Typical:1.0s
	Overcharge release voltage	3.38±0.02V
Cell over-discharge protection	Over-discharge detection voltage	2.5±0.02V
	Over-discharge detection delay time	Typical:1.0s
	Over-discharge release voltage	2.9±0.02V or charge release
Over-current protection	discharge Over-current protection current1	130±10A
	discharge Over-current detection delay time 1	1S
	discharge Over-current protection current 2	150±10A
	discharge Over-current detection delay time 2	≤100m±50ms
	Charge OC protection current	130±10A
Short protection	Short protection current	350±10A
	Protection condition	Load short
	Detection delay time	≤300us
	Protection release condition	Charging release
Temperature(T) protection	Charge high T protection	55±3℃
	Charge high T recover	50±5℃
	Discharge high T protection	65±5℃
	Discharge high T recover	60±5℃
	Charge low T protection	-5±5℃
	Charge low T recover	0±5℃
	Discharge low T protection	-20±5℃

	Discharge low T recover	-15±5℃
Balance	Balance threshold voltage	3.45V
Communication	It has RS232 /RS485 and canbus standard communication interface, it can real-time monitoring the capacity of battery bank, the voltage, current, environment temperature, and charging/discharging current.	
Alarm	It has over-temperature, over charge, under-voltage, over-current, short circuit alarm Function.	

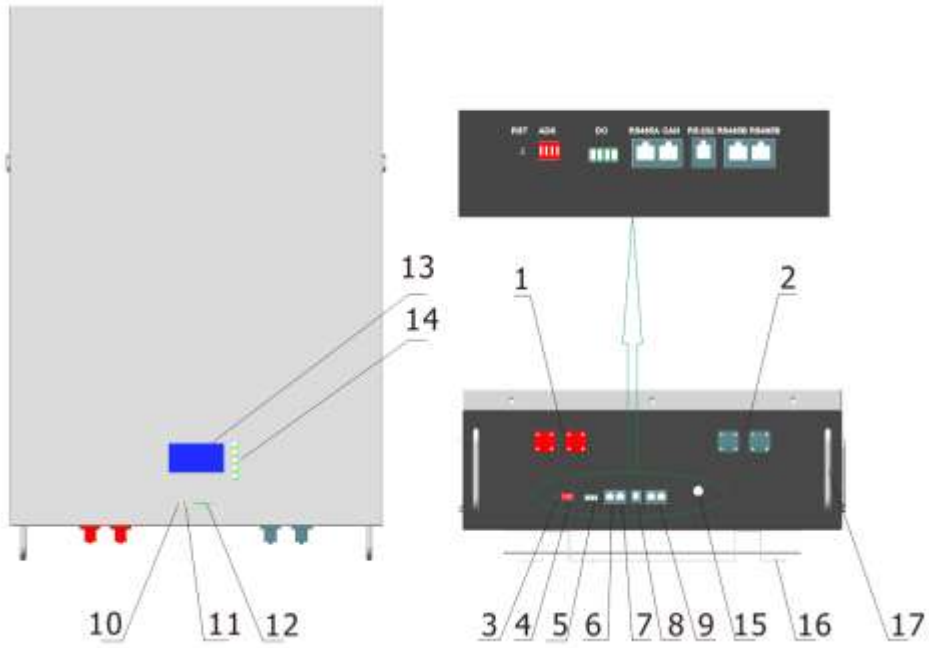
4. Appearance and structural dimensions

There shall be no such defect as scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery.



Unit（mm）					
Length	680	Width	485	Height	180
Length Outside	/	WIRE	/	Terminals	8mm fast plug
Remarks	Output cable： 35mm2，length 2m				

5. Case Structure of Battery Pack



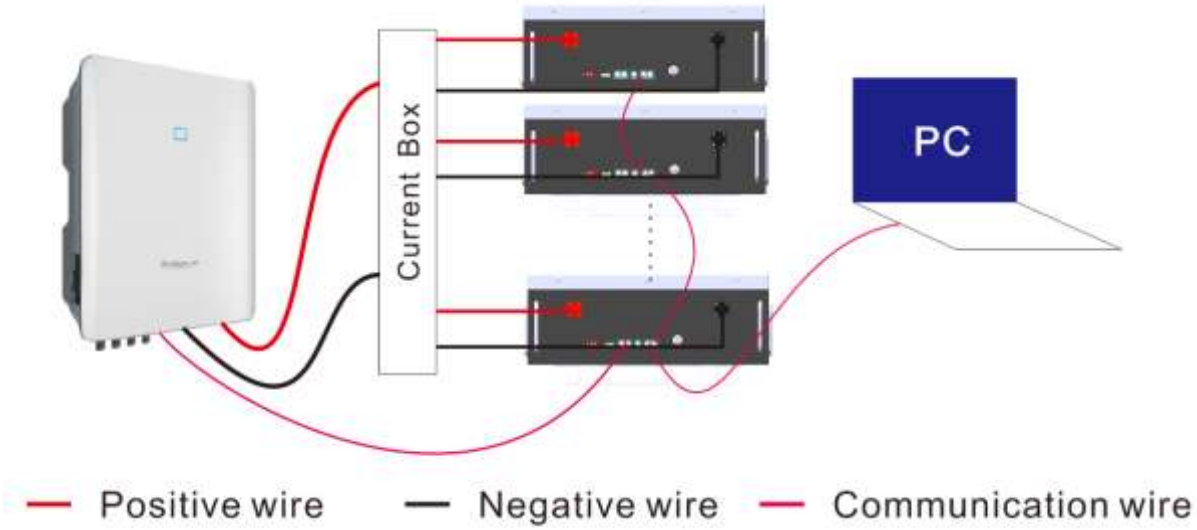
Described as followed

No.	Description	Silk-screen	Remark
1	UES0600	P+ P+	Output terminal
2	UES0600	P- P-	Output terminal
3	port Reset button	RST	For reset the batter
4	Dial switch	ADS	Set the address
5	Do		
6	CANbus Port	CANbus	CANbus and inverter connection port
7	RS485A Port	RS485	RS485 and inverter connection port
8	RS232 Port	RS232	RS232 communication port
9	RS485B port	RS485	RS485 parallel communication interface
10	LED	RUN	Operation indicator
11	LED	ALM	Alarm indicator
12	LED	CAPACITY	Capacity indicator
13	LCD		
14	LCD Key		
15	Switch		
16	Bracket		
17	Handle		

6. Connection mode for parallel communication

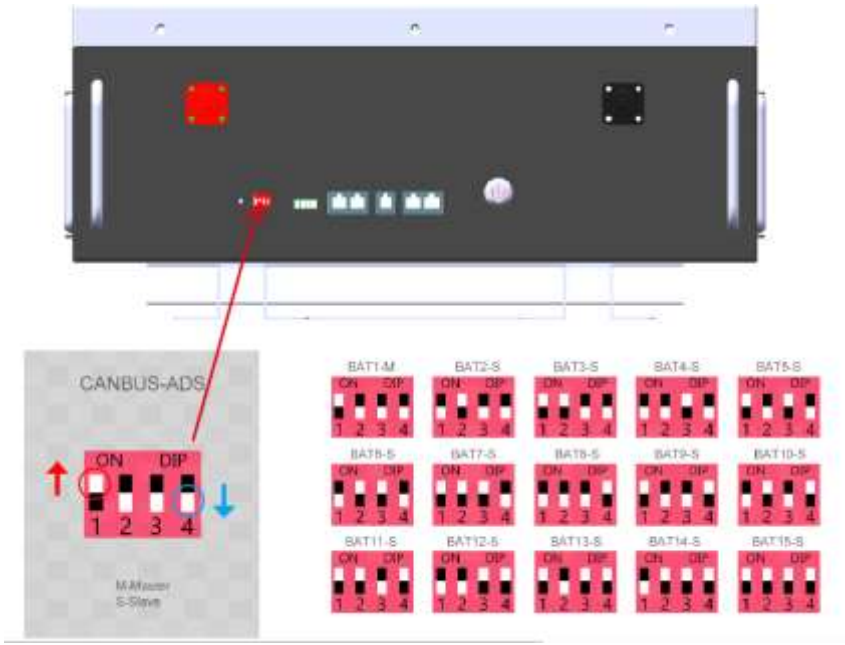
6.1 RS485 Parallel Communication

While in RS485 parallel communication, dial-up addresses of battery module are 1,2,3,4……14,15; By this method, we can be allowed to read each data depending on battery module. Any battery other than address 0 can be connected to the host computer; FF polling mode used as consulting mode.



Note: RS485 communication address can not be 0, the address set by the host computer is required to be the same as the battery communication address, do not have duplicate addresses, otherwise communication may be affected.

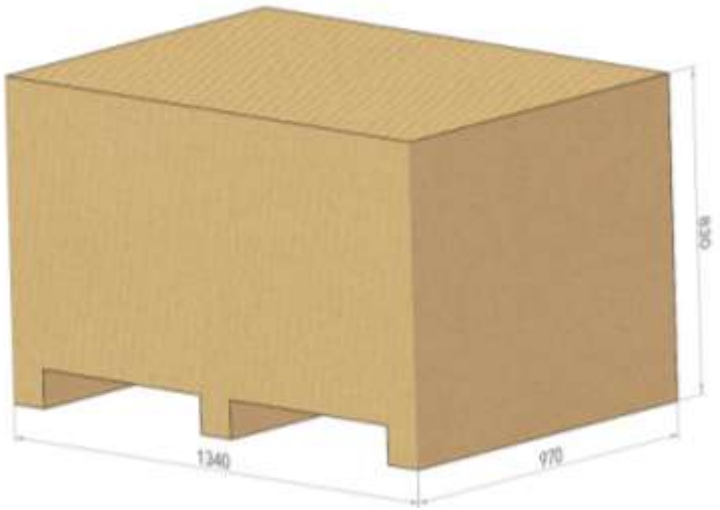
6.2 Address Switch function (Only in Parallel)



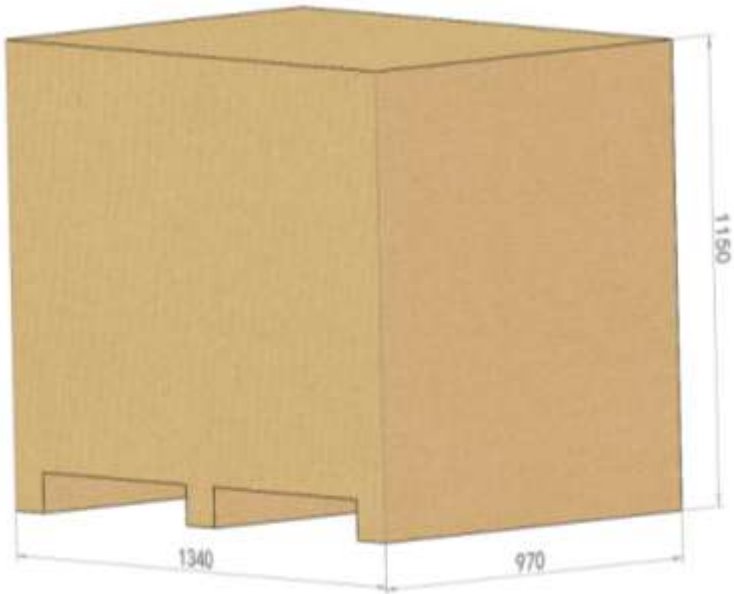
7. Packaging of Battery Pack

Carton box package for single set dimension: 820*610*310mm

Wood box package dimension：1350*950*820mm (4 sets of lithium powerwall packed inside)



Wood box package dimension：1350*950*1150mm (6 sets of lithium powerwall packed inside)



8. Battery test equipment

8.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.1mm.

8.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 KΩ/V.

8.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.

8.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method(AC 1kHz LCR meter).

9. Standard Test Condition

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 23±2℃ and relative humidity of less 75%.,air 86Kpa~106Kpa.
Unless otherwise defined, 30min,rest period after charge,30min,rest period after discharge.

10. Storage and Others

10.1 Long Time Storage

If stored for a long time(don't used,exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 51V-53V and the cell is to be stored in a condition that the temperature of 23±2℃ and the humidity 0f 45%- 75%. Long-term use of unused batteries to recharge every 3 months。Ensure that the battery voltage is within the above range。

10.2 Others

Any matters that this specification does not cover should be conferred between the customer and ENRSAVER

11. Amendment of this Specification

This specification is subject to change with prior notice.

12. Appendix

Preface

This document of 'Handling Precautions and Guideline Li-ion Rechargeable Batteries' shall be applied to the battery cells manufactured by EnrSaver

Note (1) ：

The customer is requested to contact Foshan EnrSaver New Energy Technology Co., Ltd. in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

Note (2) ：

Foshan EnrSaver New Energy Technology Co., Ltd. is not responsible for any accidents caused by using the battery under conditions other than those specified in this specification.

Note (3)：

Foshan EnrSaver New Energy Technology Co., Ltd. will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the cell, if it is deemed necessary.

Danger!

— Do not immerse the battery in water or allow it to get wet.
— Do not use or store the battery near sources of heat such as a fire or heater.
— Do not use any chargers other than those recommended by ENRSAVER.
— Do not reverse the positive(+) and negative(-) terminals.
— Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
— Do not put the battery into a fire or apply direct heat to it.
— Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
— Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
— Do not strike, throw or subject the battery to sever physical shock.
— Do not directly solder the battery terminals.
— Do not attempt to disassemble or modify the battery in any way.
— Do not place the battery in a microwave oven or pressurized container.
— Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.
—Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.

Caution!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.