

Product Specification



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Product Name: 16.0Kw Vertical energy storage

Spec.No. : BP16314

Item Coding:

Ver: A1

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Specification For Approval

Specifications : BP16314-16S1P-51.2V 314A-1.0

Approval	Checked	Draft
James Zhan	James Zhan	Tech LI
Customer Approval		

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1. Scope

This specification applies to the production of BP16300-16S1P lithium iron phosphate lithium ion rechargeable batteries by Balder Power Electronics Co., Ltd.

2. Main specifications

2.1 Cell Battery specifications

No.	Item	General Parameter		Remark
		Typical		
1	Rated Capacity	Typical	314Ah	Standard discharge (0.5C ₅ A) after Standard charge
		Minimum	310Ah	
2	Nominal Voltage	3.2V		Mean Operation Voltage
3	Internal Impedance	≤0.5 mΩ		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
4	Dimension	Thickness:Max 71.65mm		Initial Dimension
		Width: Max 174.7mm		
		Height: Max 204.47mm		
5	Weight	5.5kg		APPROX
6	Standard charge	Constant Current 0.5C ₅ A Constant Voltage 3.65V 0.02C ₅ A cut-off		Charge time : Approx2h
7	Rapid Charge	Constant Current 1C ₅ A Constant Voltage 3.65V 0.01C ₅ A cut-off		Charge time : Approx1h@ ≧ 25 °C
8	Standard discharge	Constant current 0.5C ₅ A end voltage 2.0 V		200A
9	Maximum discharge current	Constant current: 1C ₅ A end voltage: 2.0 V		300A@ ≧ 0 °C
10	Volumetric specific energy	428WH/L		APPROX
11	Gravimetric specific energy	≥160WH/KG		APPROX

Cell

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2.2 Battery Pack specifications

No.	Item	General Parameter		Remark
1	Combination method	16S1P		
2	Rated Capacity	Typical	314Ah	Standard discharge after Standard charge (package)
		Minimum	310Ah	
3	Factory Voltage	52V-54V(70-90%)		Mean Operation Voltage
4	Voltage at end of Discharge	40-44.8V		Discharge Cut-off Voltage
5	Charging Voltage	56-58V		
6	Internal Impedance	≤30mΩ		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 Current: 0.5C Constant Voltage see No.5 0.02CA cut-off		Charge time : Approx 2 h
	Limiting current	20A		
8	Standard discharge	Constant current: 0.5C end voltage see NO.4		
9	Maximum Continuous Charge Current (最大充电持续电流)	0.5C		T ≥ 10°C
10	Maximum Continuous Discharge Current	0.6C		T ≥ 10°C
11	Operation Temperature Range	Charge: 0~45°C		60±25%R.H. Bare Cell
		Discharge: -20~55°C		
12	Storage Temperature Range	Less than 12 months : -10~35°C		60±25%R.H. at the shipment state
		less than 3 months: -10~45°C		
		Less than 7 day : -20~65°C		
13	Dimensions	910*450*260mm		Include Bracket
14	Weight	Approx : 115kg		5/13

Package

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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	3.5±0.05V
Cell over-discharge protection	Over-discharge detection voltage	2.2±0.1V
	Over-discharge detection delay time	Typical:1.0s
	Over-discharge release voltage	2.3±0.1V or charge release
Over-current protection	discharge Over-current protection current1	100±9A
	discharge Over-current detection delay time 1	1S
	discharge Over-current protection current 2	100±9A
	discharge Over-current detection delay time 2	1S
	Charge OC protection current	100±9A
Short protection	Short protection current	1200A
	Protection condition	Load short
	Detection delay time	≤500us
	Protection release condition	Charging release
Temperature(T) protection	Charge high T protection	65±3℃
	Charge high T recover	60±5℃
	Discharge high T protection	70±5℃
	Discharge high T recover	65±5℃
	Charge low T protection	-40±5℃
	Charge low T recover	-35±5℃
	Discharge low T protection	-40±5℃
	Discharge low T recover	-35±5℃

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Balance	Balance threshold voltage	3.35V
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.



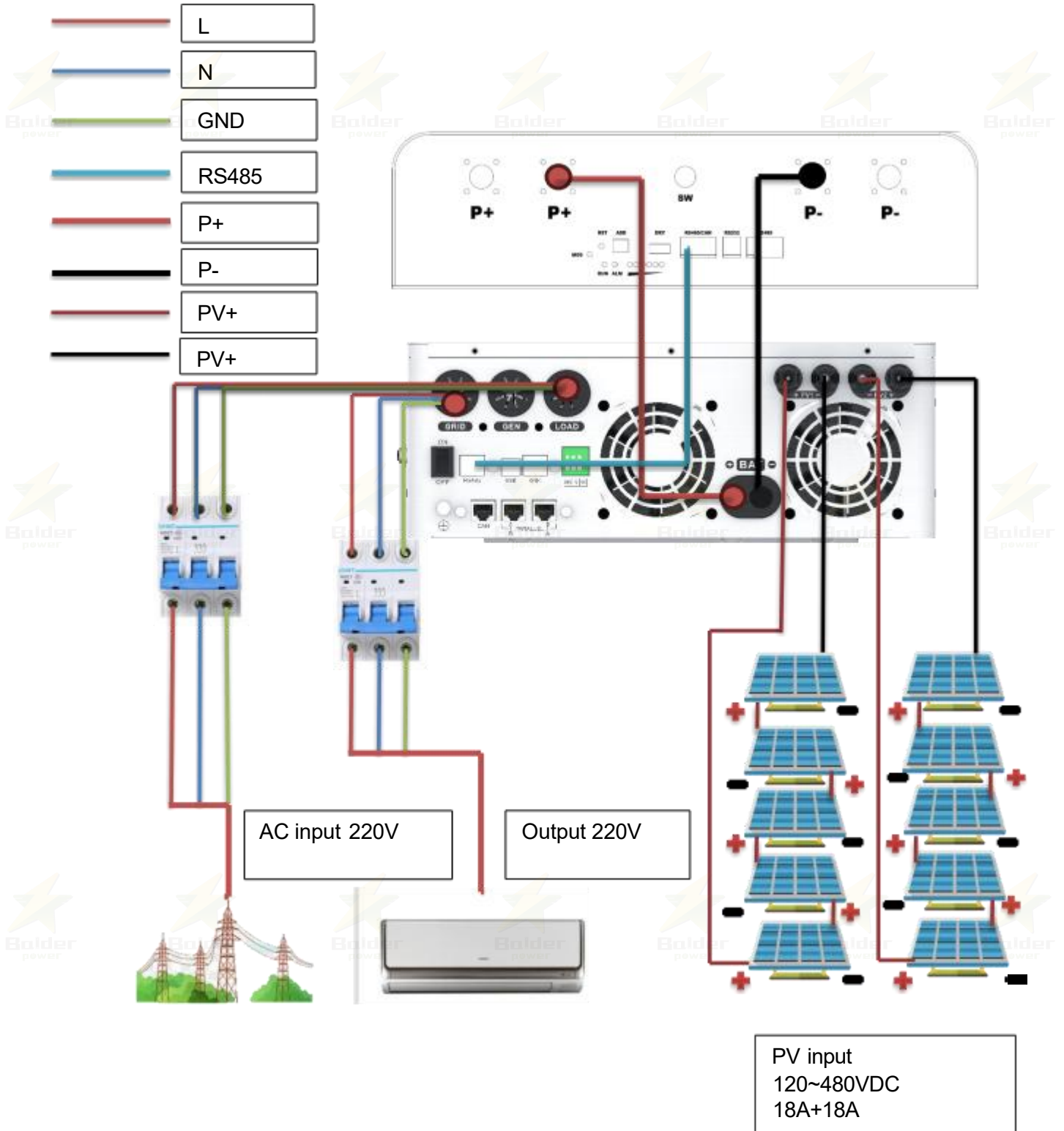
Uni (mm)

Accessories list

A	B	C	D
E	F	G	H

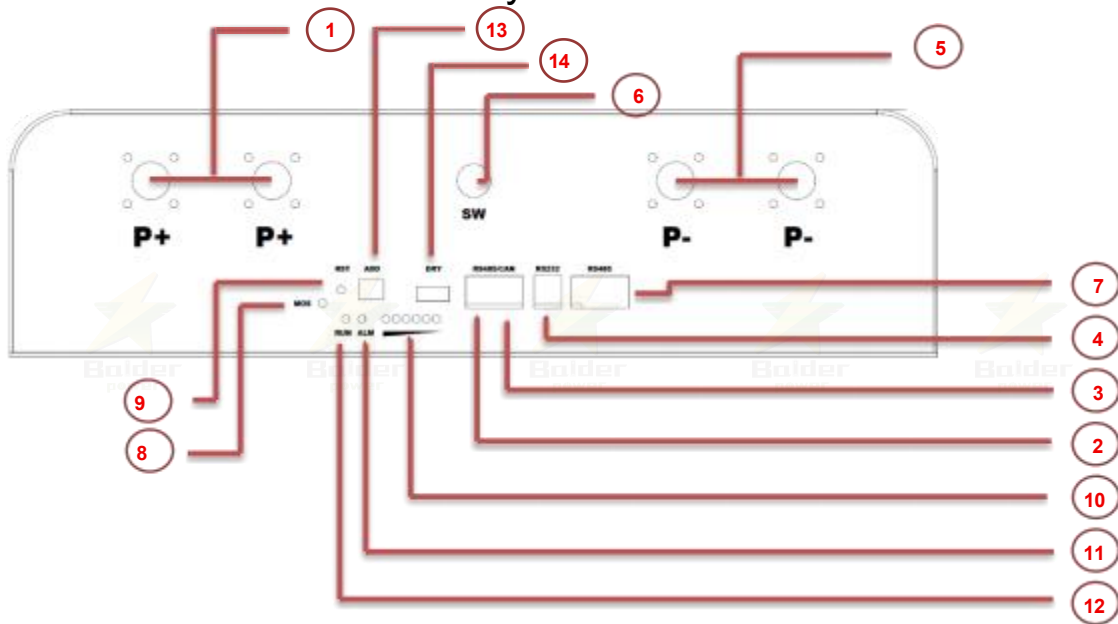
L	910	W	450	H	260
L(外露线长)	/	WIRE	/	端子型号	8mm 端子头
Note					

Use the diagram:



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5. Case Structure of Battery Pack



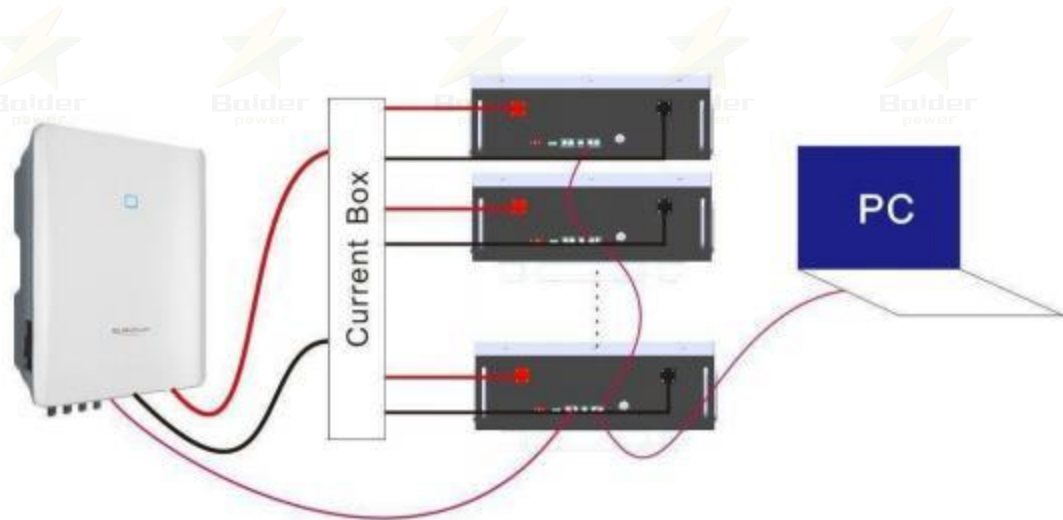
No.	Description	Silk-screen	Remark
1	300AM8	P+	Output terminal
2	RS485 port	RS485	RS485 parallel communication interfac
3	CANbus Port	CANbus	CANbus and inverter connection port
4	RS232 prot	RS232	RS232 and inverter connection port
5	300AM8	P-	Output terminal
6	Switch	SW	
7	RS485 port	RS485	RS485 and inverter connection port
8	MOS	MOS	ON/OFF
9	Reset	RST	
10	LED	CAPACITY	Cyapacit indicator
11	LED	ALM	Alarm indicat
12	LED	RUN	Operation indicato
13	Address	ADD	
14	Dry contact	DRY	

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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.



— Positive wire — Negative wire — Communication wire

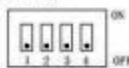
Note: RS485 communication address can not be 0, the address set by the host computer is required to be the same as the battery communication address, do not have duplicate addresses, otherwise communication may be affected.

Depending on the situation, it is possible to do without a DIP switch

6.2 Address Switch function (Only in Parallel)

The non-parallel machine can be left on hold for half an hour.

当PACK作并联使用时,可通过接口板上的拨码开关设置地址区分不同的PACK, 需避免地址设为相同。BMS拨码开关的地址参照下表。



地址	拨码开关位置			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

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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 K Ω /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 0.01 Ω .

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 \pm 2 $^{\circ}$ C 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 \pm 2 $^{\circ}$ C and the humidity Of 45%- 75%. Long-term use of unused batteries to recharge every 3 months。Ensure that the battery voltage is within the above range。长期贮存的。

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10.2 Others

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

11. Amendment of this Specification

This specification is subject to change with prior notice.

12. Appendix

Handling Precautions and Guideline For Li-ion Rechargeable Batteries

Preface

This document "Lithium-ion rechargeable battery operation Instructions and precautions" is only applicable to the battery produced by Balder Power Electronics Co., Ltd

Note (1) :

If the customer needs to use the battery for equipment other than those specified in this specification, or use the battery under conditions other than those specified in this specification, should contact Balder Power Electronics Co., Ltd in advance, as specific experimental tests are required to verify the performance and safety of the battery under such conditions of use.

Note (2) :

Balder Power Electronics Co., Ltd. shall not be liable for any accident caused by the use of the battery under conditions other than those specified in this specification.

Note (3):

If necessary, Balder Power Electronics Co., Ltd. will inform the customer in writing about the correct operation and use of battery improvement measures

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 TGPRO.

— Do not reverse the positive(+) and negative(-) terminals.

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- Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
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- Do not put the battery into a fire or apply direct heat to it.
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- Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
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- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
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- Do not strike, throw or subject the battery to sever physical shock.
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- Do not directly solder the battery terminals.
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- Do not attempt to disassemble or modify the battery in any way.
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- Do not place the battery in a microwave oven or pressurized container.
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- Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.
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- 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.