

VandalVeto[®]

Specification for 200321 Vandlaveto Battery

Pack Model:	# 200321
Cell Model:	LiFeP04 Batery 3.2V100Ah 200321
Pack:	16 S
Voltage:	51.2V
Capacity:	100Ah/5120Wh

Scope .1

This specification only applies to the reference battery in this specification

Rating .2

Item		Rating	Note
Battery Pack	Type	LiFePO4 Battery	
	Pack Method	16 S	
	Nominal Capacity	100Ah	Discharge : 0.5C Cut-off Voltage:40V
	Minimum Capacity	96Ah	Discharge : 0.5C Cut-off Voltage:40V
	Nominal Voltage	51.2V	
	Energy	5120Wh	
	Charge Voltage	58.4V	
	Discharge cut-off Voltage	40V	
	Charge Method	CC/CV	
	Standard Charge Current	≤ 100A	
	Max.Charge Current	≤ 100A	
	Standard Discharge Current	≤ 100A	
	Max.Continues Discharge current	100A	
	Cycle Life	≥ 6000 times	80% DOD
	Internal Impedance	≤ 13mΩ	
	Dimension	L443 x W435 x H178 mm	4U
	Terminal	M6	
	Communication interface	RS485、CAN、Bluetooth	
	Monitoring software	PC operation/APP	
	Weight	Approx. ≈43.00kg	
	Working Temperature Range	Charge: 0℃--40℃ Discharge: -10℃--55℃	
	Storage Temperature	0℃--40℃（Recommendation 23±2℃）	

3. Protection Circuitry Function

Function Name	Items	Set value	Set range
Cell voltage alarm	Cell high voltage warning	3500mV	Cell high voltage recovery/cell overvoltage protection
	Cell high voltage recovery	3400mV	3000mV cell high voltage warning
	Cell low voltage warning	2900mV	Cell undervoltage protection/cell low voltage recovery
	Cell low voltage recovery	3000mV	Cell low voltage warning/3300mV
Single Overvoltage Protection	Cell overvoltage protection	3650mV	Cell high voltage warning/ 4500mV
	Cell overvoltage recovery	3400mV	Cell high voltage recovery/ cell overvoltage
	Overvoltage recovery conditions	Cell voltage drops to overvoltage recovery point	
		Remaining capacity less than intermittent power capacity 96% (two conditions must be met to restore)	
		Discharging current $\geq 1A$	
Cell undervoltage protection	Cell undervoltage protection	2700mV	1500mV~ Cell undervoltage recovery
	Cell undervoltage recovery	2900mV	Cell undervoltage protection~ Cell low voltage warning
	Cell undervoltage shut down	Undervoltage protection and maintain 1 minute communication	
	Undervoltage recovery condition	Charging current $\geq 1A$	
Battery total voltage alarm	Pack high voltage warning	56.0V	Battery pack high voltage recovery~ Battery pack overvoltage protection
	Pack high voltage recovery	54.0V	53.0V~ Battery pack high voltage
	Pack low voltage warning	46.4V	Battery pack undervoltage protection~ Battery pack low voltage recovery
	Pack low voltage recovery	48.0V	Battery pack low voltage warning~ 55.0V
Total voltage overvoltage protection	Pack overvoltage protection	57.6V	Battery pack high voltage warning~ 60.0V
	Pack overvoltage recovery	54.0V	Battery pack high voltage recover~ Battery pack overvoltage
	Pack overvoltage recovery conditions	Cell voltage drops to overvoltage recovery point	
		Remaining capacity less than intermittent power capacity 96% (two conditions must be met to restore)	
		Discharging current $\geq 1A$	
Total voltage undervoltage protection	Pack undervoltage protection	41.6V	36.0V~ Battery pack undervoltage recovery
	Pack undervoltage recovery	46.4V	Battery pack undervoltage protection~ Battery pack low voltage warning
	Pack undervoltage shut down	Power off after undervoltage protection and maintain 1 minute communication	
	Pack undervoltage recovery conditions	Charging current $\geq 1A$	

Function Name	Items	Set value	Set range
Battery temperature forbidden to charge	High temperature charge warning	50°C	High temperature charge recovery~ overtemperature charge protection
	High temperature charge recovery	47°C	35°C~high temperature charge warning
	Overtemperature charge protection	55°C	Overtemperature charge recovery~80°C
	Overtemperature charge recovery	50°C	High temperature charge recovery~ overtemperature charge protection
	Low temperature charge warning	2°C	Undertemperature charge protection~low temperature charge recovery
	Low temperature charge recovery	5°C	Low temperature charge warning~10°C
	Undertemperature charge protection	-10°C	undertemperature charge recovery-20°C
	Undertemperature charge recovery	0°C	Undertemperature discharge protection~Low temperature discharge recovery
Cell temperature forbidden	High temperature discharge warning	52°C	High temperature discharge recovery~ Overtemperature discharge protection
	High temperature discharge recovery	47°C	35°C~High temperature discharge warning
	Overtemperature discharge protection	55°C	Overtemperature discharge recovery~80°C
	Overtemperature discharge recovery	50°C	High temperature discharge recovery~ Overtemperature discharge protection
	Low temperature discharge warning	-10°C	Undertemperature discharge protection~Low temperature discharge recovery
	Low temperature discharge recovery	3°C	Low temperature discharge warning~10°C
	Undertemperature discharge protection	-15°C	Undertemperature discharge recovery-30°C
	Undertemperature discharge recovery	0°C	Undertemperature discharge protection~ Undertemperature discharge recovery
Ambient temperature protection	Ambient high temperature warning	50°C	Ambient high temperature recovery~Ambient overtemperature protection
	Ambient high temperature recovery	47°C	Ambient high temperature warning -20°C
	Ambient overtemperature protection	60°C	Ambient temperature recovery~80°C
	Ambient overtemperature recovery	55°C	Ambient high temperature recovery~Ambient overtemperature protection
	Ambient low temperature warning	0°C	Ambient undertemperature protection~Ambient low temperature recovery
	Ambient low temperature recovery	3°C	Ambient low temperature warning~60°C
	Ambient undertemperature protection	-10°C	Ambient undertemperature recovery -30°C
	Ambient undertemperature recovery	0°C	Ambient undertemperature protection~Ambient low temperature recovery

Function Name	Items	Set value	Set range
Power temperature protection	High temperature power warning	90℃	Overtemperature power recovery~Overtemperature power protection
	High temperature power recovery	85℃	60℃~High temperature power warning
	Overtemperature power protection	100℃	High temperature power warning~120℃
	Overtemperature power recovery	85℃	Overtemperature power recovery~Overtemperature power protection
Charging current limit	Proactive current Limit	10A	If the charger current is bigger than 10A, enable current limiting
	Passive current limit	10A	Charger current is bigger than the overcurrent warning (value can be set), enable current limiting
	Charging current limit delay	5 minutes	After current limiting is enabled, check whether current limiting is enabled five minutes later
Charge overcurrent alarm	Overcurrent charge warning	105A	Overcurrent charge recovery~Overcurrent charge protection
	Overcurrent charge recovery	103A	0A~Overcurrent charge warning
Charge overcurrent protection	Overcurrent charge protection	110A	Overcurrent charge warning ~150A
	Overcurrent charge delay	10S	Settable
	Overcurrent recovery condition	Charging recovered immediately, or recovered automatically in 60 seconds.	
Effective charging current	Charge entering current	600mA	
	Charge exit current	500mA	
Discharge overcurrent alarm	Overcurrent discharge warning	-105A	Overcurrent discharge protection ~Overcurrent discharge recovery
	Overcurrent discharge recovery	-103A	Overcurrent discharge warning~0A
Discharge overcurrent protection	Overcurrent discharge protection	-110A	Transient overcurrent protection~Overcurrent discharge warning
	Overcurrent discharge delay	10S	Settable
	Overcurrent discharge recovery condition	Charging recovered immediately, or recovered automatically in 60 seconds.	
Transient overcurrent protection	Transient overcurrent protection	-250A	Overcurrent discharge value to 300A
	Transient overcurrent delay	30mS	Settable
	Transient overcurrent recovery	Charging recovered immediately, or recovered automatically in 60 seconds.	
	Transient overcurrent locking	Continuous two-level overcurrent, exceeding the overcurrent lock times	
	Overcurrent locking times	5 times	
	Transient locking relieve	Connecting charger	

Function Name	Items	Set value	Set range
Output short circuit protection	Short circuit protection current & delay	Has been wrote in program (couldn't be set)	
	Short circuit protection recovery	Charging recovered immediately, or recovered automatically in 60 seconds.	
	Short circuit protection locking	Continuous output short circuit, exceeding the overcurrent locking times	
	Short circuit locking times	5 times	
	Short circuit locking relieve	Connecting charger	
Effective discharge current	Discharge entering current	-500mA	
	Discharge exit current	-400mA	
Cell balance function	Stand-by balance	Balance turn-on without charge and discharge	
	Stand-by balance time	10 hours	Settable
	Charging balance	Balance turn-on in charging state and floating charge state	
	Balance on voltage	3350mV	Settable
	Balance on voltage difference	30mV	
	Balance turn off voltage difference	20mV	
	Blance temperature limit	Balance disable temperature range based on the ambient warning temperature	
	Balance high temperature limit	50℃	Settable
	Balance low temperature limit	0℃	
Cell failure alarm	Cell failure voltage difference	500mV	Settable
	Cell recovery voltage difference	300mV	

4. Performance

4.1 Standard Test Condition

The battery shall be evaluated within 1 month from the arrival date.

Unless otherwise stated in these specifications, the following test shall be carried out in an ambient temperature of $20\pm5^{\circ}\text{C}$, relative humidity of $65\pm20\%$

Discharge capacity when the battery is discharged at 50A to 40V after being standard charged. Five cycles are permitted for this test. The test shall be terminated at the end of the first cycle which meets the requirement.

4.2 Testing Instrument or Apparatus

4.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm specified.

4.2.2 Voltmeter and Ammeter

Voltmeters and ammeters shall be equal or more precision instruments of 10KΩ/V and 0.01Ω.

4.2.3 Impedance Meter

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

4.3 Standard Charge

CC-CV Charge with constant current to stated voltage, then charge with constant voltage to cut-off current

4.4 Standard Discharge

Standard discharge means discharging at **50A** down to 40V

5. Appearance

It shall be free from any defects such as scratch, contamination and leakage.

6. Pack Drawing



Packing List			
Serial number	Material packing list	Qty	Unit
1	200321	1	Pcs
2	485 to USB communication cable	1	Pcs
3	RJ45 communication line	1	Pcs
4	Screw/with gasket	2	Piece
5	User manual	1	Part

7. Battery operation instruction

7.1 Charging

Charging current: Do not surpass the biggest charging current which in this specification。

Charging voltage: Do not surpass the highest voltage which in this specification。

Charge temperature: The charge temperature is in according to this specification。

Please do not continuously charge the battery over 8hours.

7.2 Discharging

Discharge current: Do not surpass the biggest discharge current which in this specification.

Discharge voltage: Do not be less than the lowest voltage which is in this specification.

Discharge temperature: The discharge temperature is in according to this specification,

7.3 Over-discharges

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

7.4 Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for 3 months the long time storage, suggested you should carry on additional charge to the battery.

8. Warranty

As long as the cell is treated in accordance with this Product Specification and / or Handling Precautions and Prohibitions, Supplier warrants that the cell should be free from any defect for a period of 60 months (25℃ or less) from the date of shipment or for 2000 cycles, whichever comes earlier.

9. Caution

Please read the manual carefully before using it in order to ensure proper use of the battery.

Series-parallel instruction:

◎Max support 16 module in parallel

◎The parallel modules must have the same voltage, the same capacity, and the same batch;

- ◎After parallel connection, only diffuser capacity is allowed, and discharge current is not increased
- ◎Module series and parallel differential pressure $\leq 100\text{mV}$

10. Warnings

To prevent the possibility of the battery from leaking, heating, fire, Please READ this specification carefully before usage and observe the following precautions:

- ◎When recharging, use the LiFePO4 battery charger specifically for that purpose
- ◎Do not immerse the battery in water and seawater
- ◎Do not use and leave the battery near a heat source as fire or heater
- ◎Do not reverse the position and negative terminals
- ◎Do not connect the battery to an electrical outlet
- ◎Do not discard the battery in fire or heat it
- ◎Do not short-circuit the battery by directly connecting the positive and negative terminal with metal object.
- ◎Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.
- ◎Do not knock or throw, step on the battery, etc.
- ◎Do not directly solder the battery and pierce the battery with a nail or other sharp object

11. Others

◎The customer is requested to contact OUR COMPANY 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.

◎OUR COMPANY will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

◎OUR COMPANY will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the battery, if it is deemed necessary.



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