

LiFePO₄ Battery Specification

Model: JARO BT25.36



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Approved	J. Vermeulen	Remarks:	Service and propulsion battery with BMS and Bluetooth remote monitor
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Rev.	Date	Content	Revised	Remarks
V01	07-03-2018	First release	RH	

1. General Information

This specification defines the performance of rechargeable LiFePO4 battery pack JARO BT25.36 describes the type, performance, technical characteristics, warning and caution of the battery pack.

2. Specification(@Battery initial Temp25±5°C)

NO.	Items	48.200
2.1	Rated Capacity	25Ah
2.2	Energy	960Wh
2.3	Maximum continuous power	960W
2.4	Nominal Voltage	38,4V
2.5	Outgoing Voltage	36 – 39,6V (5 minutes after charging has stopped)
2.6	Internal resistance	≤40mΩ
2.7	Limited charge voltage	43,4±0.2V
2.8	Floating charge voltage	40,0±0.2V
2.9	Maximum charge current	25A @ Battery initial temperature 25+/-5°C
2.10	Standard discharge current	25A
2.11	Maximum discharge current	30A withstand 10 min @ Battery initial temp 25+/-5°C
2.12	Pulse discharge current	60A withstand 3s
2.13	Discharge cut-off voltage	30,0V
2.14	Dimension	Length: 318±3mm
		Width: 165±3mm
		Height: 215±3mm
2.15	Weight	Approximately: 9,9Kg
2.17	Operating Temperature	Charging: 0~45°C
		Discharging: -20~60°C
		Recommended operating temperature: 15°C~35°C
2.18	Self-discharge rate	Residual capacity: ≤3%/ month; ≤15%/years
		Reversible capacity: ≤1.5%/ month; ≤8%/ years
2.19	Storage Temperature & Humidity Range	Less than 1 month: -20°C~35°C, 45%RH~75%RH
		Less than 3 months: -10°C~35°C, 45%RH~75%RH
		Recommended storage environment: 15°C~35°C, 45%RH~75%RH
<p>Long time storage: If the battery need be stored for a long time, the voltage should be 39,4V (50%SOC), and stored in the condition as storage proposed conditions. The battery needs at least one charge & discharge cycle every six months.</p>		

3. Test Conditions

3.1 Standard Test Conditions

3.1.1 Unless otherwise specified, all performance tests is required conducted at temperature $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$, Humidity less than 45%~75%RH.

3.1.2 Unless otherwise specified, the tested product is required unused within two months after outgoing.

3.2 Standard Charge Mode

Standard Charge means at $25\pm 2^{\circ}\text{C}$ charge to limit voltage with 0.33C constant current, then charge with constant voltage until current less than 2% of max. charger current.

3.3 Quick Charge Mode

Quick Charge means at $25\pm 2^{\circ}\text{C}$ charge to limit voltage with 0.5 C constant current, then charge with constant voltage until current less than 2% of max. charge current.

3.4 Standard Discharge Mode

Standard Discharge means at $25\pm 2^{\circ}\text{C}$ discharge to the cut-off voltage with 0.33C current.

3.5 Quick Discharge Mode

Quick Discharge means discharge to the cut-off voltage with 0.5C current.

4. Product Performance

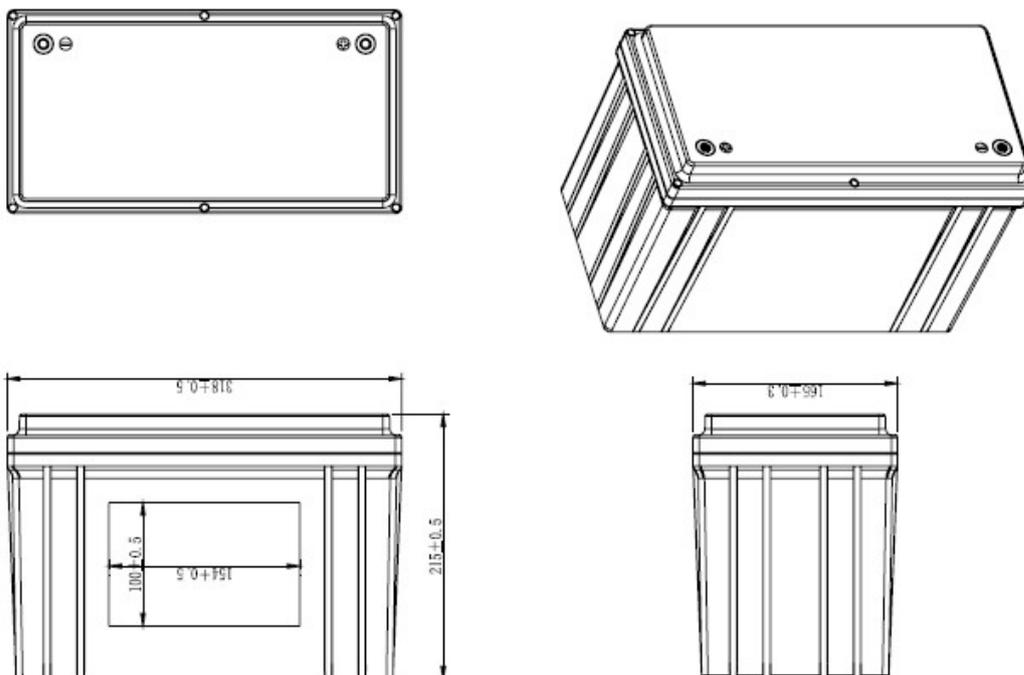
NO.	Items	Criteria		Test method
4.1	Rated Capacity	25Ah		Rest for 1 hour after fully charged, then discharge with 0.33C current until the battery reaches the discharge cutoff voltage. Repeat above process for three times, if the discharge time is not less than 120 minutes, you can stop and define the Discharging current*time value (Ah) as battery capacity.
4.2	Minimum Capacity	22Ah		
4.3	Internal resistance	$\leq 40\text{m}\Omega$		50% battery SOC state frequency of 1 KHZ ac resistance tester
4.5	Cycle life (DOD100%)	$\geq 2000\text{cycle}$		Discharge with the current of 0.33C until it can't discharge, and then rest it for 1h. Charge the battery following CC(0.33C)/CV mode to full capacity, and then rest it for 1h. Repeat above process until full charged capacity is no more than 80% of normal value. Accumulated times is defined as cycle life.
4.6	Discharge Temperature Characteristics	-20°C	$\geq 70\%$	At $25\pm 5^{\circ}\text{C}$ discharge the battery with the current of 0.33C to the cut-off voltage and record charge capacity. Store the battery at various temperatures for 2h and discharge the battery with 0.33C to the cut-off voltage.
		-0°C	$\geq 80\%$	
		25°C	$\geq 100\%$	
		55°C	$\geq 95\%$	

5. Protective circuit specification

The batteries are supplied with a LiFePO₄ Battery Management System (BMS) that can monitor and optimized each single prismatic cell during charge & discharge, to protect the battery pack overcharge, over discharge, short circuit. Overall, the BMS helps to ensure safe and accurate running.

NO.	Items	Content	Specification
5.1	Over charge	Over-charge protection for each cell	3,90±0.03V
		Over-charge release for each cell	3.60±0.05V
		Over-charge release method	Under the release voltage
5.2	Over discharge	Over-discharge protection for each cell	2,5±0.1V
		Over-discharge release for each cell	2,80±0.1V
		Over-discharge release method	Charging recovery
5.3	Over current	Discharge over current protection	70±20A
		Protection delay time	50~100ms
		Over current release method	Release after cutoff the load.
5.4	Short	NO short cut protection.	Use fuse
5.5	Battery temperature	Charge over temperature	Protection @65±5°C
			Release @55±5°C
		Discharge over temperature	Protection @65±5°C
			Release @55±5°C
		Charge lower temperature	Release @0±5°C
			Protection @-10±5°C
MOSFET over temperature	Protection @100±5°C		
	Release @70±5°C		

6. Dimensional Drawing



7. Transportation

Based on the character of cell, proper environment for transportation of LiFePO₄ battery pack need to be created to protect the battery.

Battery should be stayed in the warehouse 15°C~35°C where it's dry, clean, shade, and well-ventilated.

The battery should be stored in 50% SOC during transportation. (The suggest method: Charge the battery to 43,6V and discharge the battery until reaches the discharge cutoff voltage of 30V, then charge the battery up to 50% SOC and storage in proper circumstance according specification.)

The battery need to be charged every 6 months if out of use

Keep the battery against dropping, turning over and serious stacking during loading.

8. Warning & Tips

Please read and follow the specifications and caution remarks on the battery label before using the battery. Improper use may cause heat, fire, rupture, damage or capacity deterioration of the battery. The battery must be far away from heat source, high voltage, and avoid to be exposed in sunshine for long time.

Never throw the battery in the water.

Do not put the battery in a charger or equipment with wrong terminals connected.

Never connect the positive and negative of battery with metal.

Avoid excessive physical shock or vibration. don't hit, fall, stamp on the battery

Without the permission of the manufacturer and guidance, forbidden to remove or to assemble the battery

Do not use the battery mixed with other different manufacturer, type, or model batteries.

Keep the battery against high temperature. Otherwise it will cause battery heat, get into fire or lose some function and reduce the life.

When battery run out of power, please charge your battery timely (≤ 15 days).

Please use the matched or suggested charger for this battery.

If battery emit peculiar smell, heating, distortion or appear any abnormality during working or storage, please stop using and take it out the device.

If the battery leaks and get into the eyes or skin, do not wipe, instead, rinse it with clean water and see doctor immediately.

Please keep the battery away from children or pets.

It is strictly prohibited any series between the battery packs. Any requirements on serials connection, please contact JAROCCELLS for details.

9. Battery operation instruction

10.1 Charge and discharge

10.1.1 Charging current : Do not surpass the largest charging current

10.1.2 Charging voltage : Do not surpass the highest limited voltage

10.1.3 Charging temperature : Within temperature scope of specification

10.1.4 Charge with constant current, then with the constant voltage

10.1.5 Special note:

If long time floating is required please use the recommended floating specification. When the battery is not used for a long time, due to its own self-discharge characteristics can cause discharge, to prevent the occurrence of a total discharge, battery should be charged to 50% SOC at least every 6 months.

10. Recommendations for a long service life

Battery performance will, although slowly, deteriorate over time even if stored for a long period without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges, the life expectancy of the battery may be shortened.

