Electric vehicle power lithium battery [iron theory]

Model : KUN-20S-60V100AH

Customer :

Document NO.: KUN-20S-60V50AH

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1、Scope

The battery pack described in this specification is made of cylindrical monomer 3.2V50Ah battery cells and specification 60130 battery products.

2、Battery group specifications

	model		**KUN-20S-60V100AH**
PACK	Battery material		LFP
	Combination method		40PCS
	Minimal capacity（0.1C）		48Ah
	Minimal capacity（0.1C）		50Ah
	Nominal voltage		60V
	Max. charge voltage		73V
	Discharge cut-off voltage		44V
	Max Charge current		25A
	Max Working current		50A
	Standard charge current		12A
	Standard charge current		25A
	Pack Impedance standard【Protective plate is not included】		≤25mΩ
	Pack Impedance standard【Protective plate included】		≤50mΩ
	Weight (Approx.)		≈44.8Kg
	Max. dimension（L×W×H）(mm)		565*340*220mm
	Max. dimension（L×W×H）(mm)		710*310*220mm
	Operating temperature	Charge temperature	~0℃～60℃
		Discharge temperature	-10℃～60℃
BMS	Single charge protection voltage		3.72V
	Overcharge recovery value voltage		3.5V
	Single overdischarge protection voltage		2.2V
	Single overshoot recovery voltage		2.4V
	Charge/discharge overcurrent protection		120/200A
	Overcurrent protection delay		500mS
	Short circuit protection		1000A
	Charging temperature protection		-15±8℃
	Overcurrent \ short-circuit recovery condition		Disconnect the load
	Equalizing function		3.5v 20ma
	consumable		50UA

Note: The test data is detected at room temperature, and the test data is marked with the measured data of the tested battery, and the protection board: JBD

3, Cell Performance

project	TEST	Eligibility Criteria
3.1 Low temperature discharge capacity	After the battery is charged according to the method specified in 6.1, it is stored at -10 ° C ± 2 ° C for 16 hours to 24 hours, and then discharged at -10 ° C ± 2 ° C to the termination voltage.	Discharge capacity/nominal capacity× 100% ⩾75%
3.2 High temperature discharge capacity	After the battery is charged according to the method specified in 6.1, it is stored at 55 ° C ± 2 ° C for 5 hours, and then discharged at 55 ° C ± 2 ° C to the termination voltage at 0.5 C。	⩾98%
3.3 rate performance	After the battery is charged according to the method specified in 6.1, it is left in the environment of 20° C±5° C for 1h-4h, and then discharged at 20 ° C ± 5 ° C to the termination voltage at 0.5C/1C.	0.5C⩾100% 1C⩾99%
3.4 Charge retention recovery capability	After the battery is charged according to the method specified in 6.1, it is stored at 25 ° C ±2 ° C for 28 days, and then discharged at 0.5C to the termination voltage. The discharged battery is charged according to the method specified in 6.1 within 24h, and then stored in the environment of 25° C±2° C for 1h-4h, and then discharged to the termination voltage at 0.5C。	⩾95%
3.5Storage performance	After the battery is charged according to the method specified in 6.1, it is discharged at 0.5C for 60 minutes at 25° C ±2° C, and then stored at 25° C ±2° C for 90 days. The battery is charged according to the 4.1 method, set aside for 1h-4h, and then discharged at 0.5C in the environment of 25° C ±2° C to the termination voltage. Charge-discharge cycles are allowed up to 5 times.	⩾98%
3.6 Cycle life	After the battery is charged according to the method specified in 6.1, it is put on hold for 30min, and then discharged at a constant current of 0.5C to the discharge termination voltage, and then left for 30 minutes;。	The battery capacity is not less than 75% of the initial capacity after 2000 weeks

3、Environmental Function

project	TEST	Eligibility Criteria
4.1Temperature cycling	After the battery is fully charged, follow the steps below to cycle the temperature in the forced ventilation box (-10 ° C-75° C). Step 1: The battery is left at 62° C±2° C for 4 hours.	No leakage No fire

	Step 2: Reduce the temperature to 20° C±5° C within 30min and keep for 2 hours. Step 3: Reduce the temperature to -10° C ± 2° C within 30min and keep for 4 hours. Step 4: Increase the temperature to 20° C ± 5° C within 30min and keep it for at least 2 hours. Step 5: Repeat the above step 4 cycles. Step 6: After the 5th cycle, store for 7 days.	Does not explode
4.2shake	After the battery is fully charged, confirm that the battery voltage is fully charged, then fix the battery on the shaker, and apply a simple harmonic vibration with an amplitude of 0.76mm, with a total maximum offset of 1.52mm. The battery vibrates at a rate of 1Hz at a frequency of 10HZ-55HZ-10HZ, with a total time of 90±5min. The battery is mounted in three perpendicular positions (in the direction of vibration) and vibrates once each. After the test is completed, set aside for 1 hour.	Does not explode No leakage No fire

4.3Low voltage	After the battery is fully charged, place it in a vacuum chamber at 20° C ± 5° C. The pressure of the vacuum chamber was gradually reduced to 11.6kPa and held for 6 hours.	No leakage No fire Does not explode

4、Safety tests

project	test	Eligibility Criteria
5.1External short circuit	The fully charged battery is placed in an environment of 20° C ± 5° C, and the positive and negative terminals are directly shorted with a wire with a resistance of 80m until the battery voltage reaches 0.2V.	No leakage No fire
5.2 Free Fall	The fully charged battery is free to fall from a height of 1.0m onto the concrete floor 3 times in a random direction.	No leakage No fire
5.3 Extrusion	A fully charged battery is placed at 20° C±5° C; Extrusion direction: perpendicular to the direction of cell arrangement; Extrusion head radius: 75mm; Extrusion degree: until the size of the battery pack becomes less than 70% of the original or the extrusion force exceeds 30KN.	No leakage No fire
5.4 Overcharge	After the battery pack is fully charged, the battery pack voltage	No leakage

	is then charged to 70V.	No fire
5.5 Over-discharge	The battery is discharged at a current of 1C at 20° C±5° C (if there is an electronic protection line, the discharge electronic protection circuit should be temporarily removed) until the voltage of a single cell reaches 0V.	No leakage No fire

5、Test Conditions

Unless otherwise stated, all tests should be performed in still air.

6.1 Charging Method

Before charging, the battery should be discharged at a constant current of 25A at an initial temperature of 25±1° C to the end of discharge voltage. Unless otherwise stated, the battery should be charged at an initial temperature of 25±1° C at a constant current of 25A to 73V, and then charged at a constant voltage of 73V until the current drops to 0.02C and stop charging.

6.2 Environment

Temperature: 25±2° C

Humidity: 25-85%RH

Atmospheric pressure: 86KPa-106KPa

6、Storage and Others

7.1 Long-term storage

Batteries stored for a long time (more than 3 months) should be placed in a dry and cool place, and the batteries should be charged and discharged every 3 months.

7.2 Miscellaneous

Matters not mentioned in this specification shall be determined through consultation between the two parties.

7、Warranty Period＆Product Liability

8.1 The shelf life is from the date of delivery (coding/marking) and is set separately in the sales contract.

8.2 The Company shall not be liable for any accident caused by failure to operate in accordance with the precautions specified in the manual.

8.3 If the problem that occurs during the warranty period is not caused by the company's production process or is caused by the customer's own abuse or improper use, the company will not replace it free of charge.

8.4 When the version of this specification is updated, the Company will not notify you otherwise.

8、Caution

9.1 Do not disassemble the battery, there is a risk of explosion.

9.2 The battery should be kept away from fire and heat sources, and away from direct sunlight.

9.3 Do not short-circuit the battery and avoid placing the battery in a place that is likely to cause a short circuit.

9.4 If the charging and discharging ports are separated, the charging port and the discharge port cannot be mixed, otherwise safety accidents may occur.

9.5 Protect the battery from shocks.

9.6 When the battery leaks, avoid contact with the electrolyte to the skin and eyes. In case of contact, rinse immediately with plenty of water, and seek medical attention if the condition is severe.

9.7 When connecting, ensure that the positive and negative poles of the battery are consistent with the positive and negative poles of the electrical appliance, and avoid reverse connection.

9.8 Keep batteries out of the reach of children.

9.9 Batteries should be kept clean and dry.

9.10 When the battery terminals become dirty, they can be wiped with a dry cloth.

9.11 The battery should be charged before use, and the charger designated by the manufacturer should be used to charge it according to the instructions in the user manual.

9.12 The battery cannot be charged for a long time when not in use.

9.13 After prolonged storage, the performance of the battery will recover best after several charges and use.

9.14 Batteries perform best at room temperature (25° C±2° C).

9.15 Retain the instructions for subsequent reference.

9.16 Batteries cannot be used in series or parallel, please check the voltage and range carefully when using them for other purposes.

9.17 The battery needs to be removed from the appliance when it is not used for a long time.

9.18 Do not throw away batteries.

9、Free-responsibility declaration

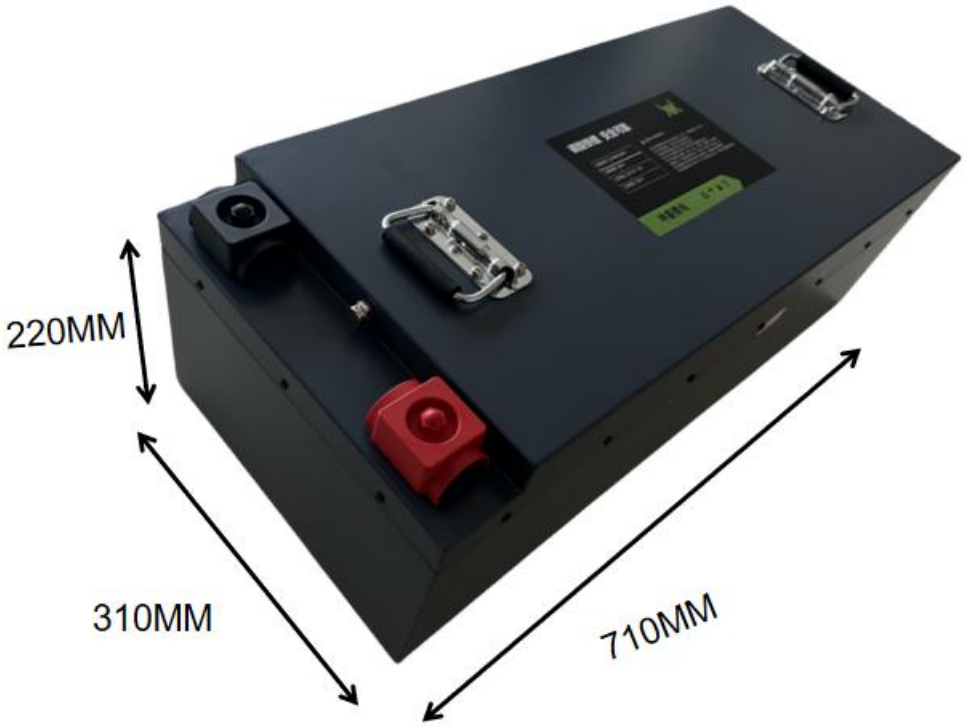
Before using the product, please carefully read the product specifications, instruction manuals and precautions for use to understand the use and application scope of the product; If there is an error in the use of the product, the circuit connection is incorrect, or the input power supply, load function parameters are inconsistent with the performance parameters marked in the product specifications, etc., it is improper use, and the company does not assume any responsibility for the damage to the product, load and peripheral connections caused by improper use.

10、 Appendix

11.1 The battery cell adopts a cylindrical power 3.2V50Ah iron cell produced by Duofluoride Company. Specifications are attached

11.1 The battery cell material is made of lithium iron phosphate cathode material, and the material characteristics are attached。

11、PICTURE：


220MM
310MM
710MM