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The file number：
Version： A/0
Release date： 2022-3-15

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Product Specifications

Battery model ： KG48-100FT32

Prepared By	Checked By	Approved By	Customer Approved

Hangzhou Kaige New Energy Technology Co., Ltd

Revising the history

Revision times	Release date	Revision
0	2022/3/15	First issue

Contents

1. Introduction

This manual applies to the Lithium ion battery siring by Hangzhou Kaige New Energy Technology Co., Ltd. Please test according to the instruction of this manual. If you have any difference in testing program or instructions, please contact Hangzhou Kaige New Energy Technology Co., Ltd for solution.

2. Product Categories and Specification

2.1. Categories：phosphoric acid iron and lithium ion polymer Battery Block

2.2. Specification: KG48-100FT32

3. General Technology Parameters

Specification	KG48-100FT50	**Rated Voltage**	48V
Charge Instruction	CC/CV	**Rated Capacity**	⩾100Ah
Maximum Charge Current	50A (if higher than 50A,charging current will become 10A)	**Maximum Discharge Current**	100A
Recommended charging current	20A	**Charge Voltage**	54V
Internal Resistance	⩽200mΩ	**Over Discharge Final Voltage**	⩾39V
Weight	≈43Kg	**Relative Humidity**	25%～80% RH
Working Temperature	Charge Temperature: 0 to 40℃ Discharge Temperature: -20 to 55℃ Storage: -20 to 45℃	**Outer Dimension**	360*570*140 mm Do not include handle size Wall mount
Case and Cover	sheet metal	**communication protocol**	RS232 /RS485 / CAN
Dry contact	Support (Normally Closed)	**Design Life**	10 years

It is forbidden to use battery pack in series. If it needs to be used in parallel, please coordinate with Hangzhou Kaige New Energy Technology Co., Ltd

4. Outer Dimension and Appearance

Clean appearance, no electrolyte leak, no apparent scratch and mechanical break, no shape distortion and no other outer defects which influence the battery value.

5. Functions

5.1. Standard Test Conditions

Tested battery must be newly dispatched from our factory not more than one month and never be charged and discharged for five times cycle. Unless other special requirement, the test conditions instructed by this manual should be :temperature 25±2℃, relative humidity 45%~85%. If test results have been proved not to be influenced by these conditions, test can be also carried out at the condition of temperature 15~30℃, relative humidity 25%~85%

5.2. Requirement for test equipment

(1) Measurement precision should be ≥0.01mm

(2) Voltage and current accuracy of multimeter should not be lower than class 0.5; testing internal resistance should not be less than 10kΩ/V.

(3)Principle for the resistance tester should be AC impedance method（1kHz LCR）.

(4)Current precision of battery test system should be higher than ±0.1%,CV precision ±0.5%,time precision not lower than ±0.1%.

(5) Thermometer precision should not be lower than ±0.5℃

5.3. Standard Charge

It is recommended to charge in $0.2C_2A$ and when the terminal voltage comes to the limited charge voltage ,it should change to CV charge and then stop until the charge current is ≤$0.02C_2A$, the longest hour is not more than 8h.

5.4. Intervening Time

Unless the special requirement ， the interval between charge and discharge should be 30mints.

5.5. Original Function test

Item	Test Method	Requirement
(1) AC internal resistance	After standard charge， use AC impedance method to measure the resistance at25±2℃	≤200mΩ
(2)$0.2C_2A$ discharge(rated capacity）	After standard charge, lay aside the battery block for 0.5h～1h and discharge to terminal voltage in CC of $0.2C_2A$. Remake the experiment for three times and when the discharge time complies with the requirement, stop at once	Discharge time for battery block should not be more than 4h45min
(3)$1.0C_2A$ discharge capacity	After standard charge, lay aside the battery block for 0.5h～1h and discharge to terminal voltage in CC of 1 C_2A. Repeat the experiment for three times and when the discharge time complies with the requirement, stop at once.	Discharge time for battery block should not be more than 54min

5.6. Electric Characteristic Test

5.6.1. Discharge Temperature Characteristic

Charge the battery block at 25±2℃ ,and then heat or cool in 30 min to test temperature. Keep it for 1h at this temperature before the discharge in 0.2C2A. After finishing one particular temperature test, charge for 2h at 25±2℃.

Requirement as followed:

Discharge temperature	-10℃	25℃	55℃
Discharge capacity	70%	100%	95%

5.6.2. Recycling Characteristic

After standard charge, lay aside the battery for 30 min and discharge in 0.5 C2 to final voltage. Repeat the above steps to cycle until the discharge capacity is lower than 72min in two continuous hours at 25±2℃, which is an very important parameter influencing the recycling characteristic, requirement as following:

Recycling times ≥ 2000 times

5.6.3. Charge Retention Characteristic

Item		Test Method	Requirement
Storage at common temperature	1	After standard charge, lay aside the battery block for 28 days at 20℃±5℃ in the open circuit, and at the same conditions , discharge to final voltage in CC of 0.5ItA, and then test the discharge time (Charge Retention).	Discharge Time≥1h36min
	2	After the standard charge the battery block by the charge retention test ,lay aside for 1h and discharge in 0.5C2A to final voltage, repeat the above test for 3 times ,and when the discharge time complies with the requirement, stop at once.	Capacity Recovery ≥1h48min

5.6.4. Long Time Storage Characteristic

Tested battery must be newly dispatched from our factory not more than 3months and charge 50~60% capacity before the storage at the condition of temperature 40℃±5℃, relative humidity 45%～75%. Take out the battery block when storage finishes, and after standard charge the battery block lay aside for 1h and discharge in 0.5C2A to final voltage. repeat the above test for 3 times ,and when the discharge time complies with the requirement, stop at once. requirement as following:

Discharge time ≥1h12min

5.7. Mechanical Characteristic

Item	Test Method	Requirement
Constant humidity characteristic	After standard charge ,put the battery block into the constant temperature and humidity at the temperature of 40 ℃ ± 2 ℃ and the relative humidity of 90 % ～95 % ,and then take out the battery block and lay aside for 1h at the temperature of 20℃ ± 5 ℃, range estimate the appearance and discharge to final voltage in the CC of 0.5C_2A.	Discharge time should be not shorter than 1h48min, and there should not be distortion and rust in the appearance.
vibration	Fix the battery block on the vibration board and then vibrate in the only direction of up and down and in the frequency of 10Hz～55Hz at the biggest acceleration of 30m/s for 2h . Discharge to final voltage in the CC of 0.5C_2A.	There should not be apparent scratch, fluid leaking, smoke and explosion in the appearance. Charge and discharge the battery block in the normal way and the discharge capacity should not be lower than 95% of nominal capacity.
Free fall	After the above vibration experiment, make the experiment of free falling at the following conditions: Drop height is 600mm(the lowest point of height), use the 20mm thick and tough board to catch the battery block, falling direction is from the X,Y,Z respectively once along the horizontal direction and fall respectively once on both sides.	No gas and fluid leak, no break and no fire and explosion.

5.8. Safety Characteristic

Item	Test Method	Requirement
Over discharge	Discharge the fully charged battery block in 0.5C_2A till to the over discharge final voltage and then circuit protector should take effects and automatically stop discharging.	No explosion, no fire ,no smoke and it can be charge and discharged in the normal way.
Overcharge	Charge the battery sting in 0.5C_2A and when the voltage comes to the over charge protection voltage , circuit protector should take effects.	No explosion, no fire ,no smoke and it can be charge and discharged in the normal way.
Short Circuit	Put the battery block with thermocouple into the ventilating cabinet and use the cooper conductor 0f smaller than 10m Ω internal resistance to short circuit the positive and negative of the battery block.	Over current protect the battery block.cut the discharge circuit.
High temperature storage	Put the battery block into baking oven at oven temperature of 75℃±2℃ for 8h.	No gas and fluid leak, no break and no fire and explosion.

6. Direction for use

Read this manual carefully to make sure working with the Li-ion battery properly. We hold no responsibility on the problems against the following notice.

Danger!

Reading the following notice not carefully may lead to the battery leak , explosion or fire.

— Do not dispose the battery into the water or make it wet.
— Stow away from heat (fire or heater)
— Do not reverse the polarities.
— Do not directly connect the battery with wall outlet or car cigarette-lighter Plug.
— Do not dispose the battery into the fire or heat it.
— Prohibit using the conductor or metal object to short-circuit the positive and negative charges and transporting or storing the battery together with the necklace、hairpin or some other metal object.
— Prohibit cracking、dropping or mechanically vibrate the battery.
— Prohibit using the nail or other sharp object to penetrate the battery shell and hammering or trampling on the battery.
— Prohibit discompose the battery in any way.-
— Do not charge the battery near the fire source or at the very high temperature.

Warning!

Reading the following notice not carefully may lead to the battery leak , explosion or fire.

— Prohibit putting the battery into the Micro-wave oven or pressure container.
— Prohibit combine the battery with disposable battery (such as dry battery) or battery block in different capacity、specification or model,
— Stop using the battery when some abnormal situation happened such as disgusting smell、heat up、distortion or discolor. If the battery is working or charged, take out the battery from the electrical appliance or charger and stop using at once.
— Keep the battery far away from the children's reach.
— if battery leaks or smells, move away from the fire nearby. The leaking electrolyte may lead to fire or explosion.
— if any eye contact with the leaking electrolyte has occurred, flush the eyes with large amounts of running water and seek medical attention. If not ,the eyes will be hurt.

Cautions!

— Do not use the battery at the very high temperature, such as the direct shine of sun or sealed container in hot days. Or it will become too hot to fire and then influence the function of battery of decrease the battery life.
— Only work under the following conditions or it will decrease the function or life of battery. Only wok within the temperature range, or it will lead to overheat、explosion or fire.
— We don't advise you to use in series with this type of battery . If the customer insist to use in series, the Max series turns must less than 4 series.

Work environment：

Charge ： 0℃~45℃ Discharge : -10℃~55℃

Storage for 30d：-20℃~45℃ Storage for 90d：-20℃~35℃

In case of any skin or clothes contact with the electrolyte, remove contaminated clothing and flush affected areas thoroughly with running water. If a rash should persist after rinsing seek medical attention.

Read the installation instructions, install and dismantle the battery properly.

If disuse the equipment for longtime, take out the battery and lay aside up at cool, dry place,. Or it will probably become rusted or function decreased..

If the terminal of battery blocks is polluted, clean with dry clothing before using. Or the block will be poorly connected and lead to energy consumption or cannot be charged.

Each for 3 months, to recharge a battery pack, recharging the battery pack within 48 h after discharge, otherwise, will influence the battery life.

7. Battery status dispatched from factory

It has been charged into about 50% of electrics and single battery voltage is 3.30~3.45V.

8. Revision of product specification

Product Specifications are subjected to change at any time with RealForce reserving all rights and privileges

9. Outer Drawings

Caution:

The picture is a schematic diagram, the final product as a standard