

Product specification

产 品 规 格 书

Customer Approval 客 户 确 认	Signature 签名	Date 日期
	Company Name: FLOWZONE(SuZhou)Electric Co., Ltd 公 司 名 称:	
	Company Seal: 公 司 印 章	

Product: Lithium-ion battery pack

Specification: 18V - 2600mAh (INR18650 M26)

Draw Up: 詹 世 保

Verify: 朱 雪 冬

Quality confirmation: 代 颖 颖

Approval : 谢 文 红



苏州力神能源科技有限公司

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Version: V1.0

Date: 2019.04.25

Suzhou Lishen Energy Science & Technology Co.,Ltd.

Revision record

Revision status	Draw up	Revision record	Date
REV: V1.0	詹世宝	苏州力神FLR_501（18V/2.6AH喷雾器）电池包规格书首版发布	2019-4-25

I , General Description

II , Applications

III, Environmental Characteristics

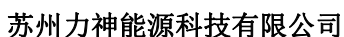
IV , Electrical Characteristics (Ta=+25℃)

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I ,General Description

The lithium battery pack is a 18V - 2600mAh lithium battery pack specially developed for flowzone developed by Suzhou Lishen Energy Science & Technology Co., Ltd. for FLR_501 sprayer project . The battery pack has overcharge protection, overdischarge protection, overload protection, short circuit protection, and low temperature protection, charging high temperature protection, discharge high temperature protection, LED light indication, charging can not discharge, etc., is the only technical basis for designing and testing the battery pack.

II, Applications

Sprayer power supply

III, Environmental Characteristics

Operating temperature:	Charging: 0°C ~ +45°C, Discharge: -15°C ~ +65°C
Storage temperature:	One month: -20°C~50°C Three months: -20°C~40°C One year: -20°C ~ 20

Static electricity requirement:
Contact 8KV, Air discharge 15KV.

Notes:

Static electricity protection, prohibit extrusion, collision, prohibit stacking, keep away from fire source. When not in use for a long time, please take out the battery pack from the machine and charge the battery once every three months.

IV, Electrical Characteristics (Ta=+25°C)

	Battery model	INR18650 M26 (LG)			
	Rated battery pack nominal voltage	18V			
	Rated battery pack nominal capacity	2600mAh			
	Standard charging method	CC:1000mAh CV:21V End Current: 100mA			
	Rated maximum charging voltage	21V			
	Rated maximum charging current	1.5A			
	Rated discharge current	4.5A			
	Maximum continuous discharge current	8.3A			
	Discharge cutoff voltage	13.5V			
N O	Features	Range			Description
		Min	Typical	Max	
1	Overcharge protection	4.175V	4.200V	4.225V	
2	Overcharge protection delay time	0.5S	1S	1.5S	
3	Secondary overcharge	4.190V	4.220V	4.250V	
4	Secondary overcharge protection delay	0.5S	1S	1.5S	
5	Overcharge recovery	4.050V	4.100V	4.150V	
6	Overcharge recovery delay time	0.5S	1S	1.5S	
7	Overdischarge protection	2.650V	2.700V	2.750V	
8	Overdischarge protection delay time	0.5S	1S	1.5S	
9	Overdischarge recovery	2.900V	3.000V	3.100V	
10	Overdischarge protection recovery condition				1、 The voltage rises back to the overdischarge recovery point and the load is disconnected 2、 Charging;
11	Charging overcurrent protection	1.458A	1.5A	1.875A	



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12	Charging overcurrent protection delay	0.5S	1.0S	1.5S	
13	Overcurrent protection I	7.5A	8.3A	9.17A	
14	Overcurrent-protection delay	1S	2S	3S	
15	Overcurrent protection II	15A	16.7A	18.3A	
16	Overcurrent protection II delay	0.1S	0.2S	0.3S	
17	Short circuit protection	29.2A	33.30A	37.50A	
18	Short circuit protection delay	150uS	250uS	350uS	
19	Overcurrent, short circuit protection recovery conditions				Disconnect load
20	Charging low temperature protection point	-4℃	0℃	4℃	
21	Charging low temperature protection delay time	1.5S	3S	5.5S	
22	Charging low temperature recovery point	1℃	5℃	9℃	
23	Charging low temperature recovery time	1.5S	3S	5.5S	
24	Charging high temperature protection point	46℃	50℃	54℃	
25	Charging high temperature protection delay time	1.5S	3S	5.5S	
26	Charging high temperature recovery point	43℃	47℃	51℃	
27	Charging high temperature recovery time	1.5S	3S	5.5S	
28	Discharge high temperature protection point	66℃	70℃	74℃	
29	Discharge high temperature protection delay time	1.5S	3S	5.5S	

30	Discharge high temperature recovery point	51℃	55℃	59℃		
31	Discharge high temperature recovery time	1.5S	3S	5.5S		
32	Discharge high temperature recovery condition				The temperature is lowered to the recovery temperature	
33	Power consumption			30uA		
34	Can not discharge when charging				Cut off the discharge output while charging	
35	LED light indication - charging status	100%	-	-	■ ● ● ● ● ●	Led1,led2,led3,led4 , Led5 on
		81%	-	99%	■ ● ● ● ● ●	Led1,led2,led3,led4 on, Led5 flashing with 1Hz
		61%	-	80%	■ ● ● ● ● ●	Led1,led2,led3 on, led5 off, Led4 flashing with 1Hz
		41%	-	60%	■ ● ● ● ● ●	Led1,led2 on,led4,led5 off, Led3 flashing with 1Hz
		21%	-	40%	■ ● ● ● ● ●	Led1 on,led3,led4,led5 off, Led2 flashing with 1Hz
		0%	-	20%	■ ● ● ● ● ●	Led2,led3,led4,led5 off, Led1 flashing with 1Hz
36	LED light indication - discharge status	81%	-	100%	■ ● ● ● ● ●	Led1,led2,led3,led4 , Led5 on
		61%	-	80%	■ ● ● ● ● ●	Led1,led2,led3,led4 on, Led5 off
		41%	-	60%	■ ● ● ● ● ●	Led1,led2,led3 on, led4,Led5 off
		21%	-	40%	■ ● ● ● ● ●	Led1,led2, on, led3,led4,Led5 off
		11%	-	20%	■ ● ● ● ● ●	Led1 on, led2,led3,led4,Led5 off
		0%	-	10%	■ ● ● ● ● ●	led2,led3,led4,Led5 off, Led1 flashing with 1Hz
		Protection event			■ ● ● ● ● ●	Red led on
37	Charger abnormal indication	22.5V		19.5V	■ ● ● ● ● ●	Led1,led2,led3,led4 , Led5flashing with 2Hz within10S
38	Charging timeout protection	4H			The charger is charged for a maximum of 4H, and the charger is turned off by more than 4H.	

V, Battery Pack Structure Drawings



VI, Transportation Packaging Requirements



The package design needs to comply with the UN3480 standard for air and sea transportation.

VII, Battery specification

LG_INR18650M26_Specification (Appendix)

VIII, Lithium Battery Safety Precautions

1. Safety Code

- 1.1** The battery core contains flammable substances such as organic solvents. If it is used improperly, it may cause heat or fire in the battery core, causing damage to the battery core or personal injury. Please pay attention to the prohibition of use, and at the same time, add protective devices to avoid battery accidents caused by abnormal equipment. Please read the following safety guidelines carefully before using lithium ion rechargeable batteries. In addition, it is strongly recommended that these instructions be added to the user manual.

2.1 Dangerous matters

- 2.1.1** Do not use or place the battery in a high temperature (above 70℃) environment. Do not throw it into a fire, water or allow it to absorb moisture. Do not repair or disassemble the battery. There is a danger of ignition, overheating, leakage or explosion of the battery.
- 2.1.2** Do not confuse the cells and keep away from conductive materials such as metal to avoid a positive (+) negative (-) pole short circuit. Do not reverse the positive (+) negative (-) pole of the battery.
- 2.1.3** Do not use non-regulated charging devices and violate charging requirements. Unregulated charging can cause over-charging or abnormal chemical reactions, heat generation, smoke, rupture or fire.
- 2.1.4** Do not connect the battery to the AC plug (outlet) or the car plug. The battery needs to have a specific charger. If the battery is directly connected to the plug, the battery may catch fire, smoke, explode or cause heat.
- 2.1.5** Do not overcharge, over discharge, acupuncture, hammer the battery.
- 2.1.6** Do not hit or throw batteries. If the battery core drops, please treat it as waste and cannot continue to use it.
- 2.1.7** Do not dissect the battery. If the protection circuit is damaged, the battery will no longer be protected. Then, the battery may catch fire, smoke, explode or cause fever.
- 2.1.8** Do not charge near high temperatures. If the battery is charged near a high temperature, the battery cannot be recharged due to the protection circuit. In this

situation, the protection circuit may be interrupted, and the battery may catch fire, smoke, explode or cause heat.

- 2.1.9** Do not use batteries that are significantly damaged or deformed. May cause fever, smoke, break or burn
- 2.1.10** Do not use soldering directly to solder the cell. Overheating can cause deformation of the cell components such as the insulating gasket, causing the cell to deform, leak, explode or catch fire.
- 2.1.11** Do not charge in reverse polarity. When charging, the battery is reversely charged and an abnormal chemical reaction occurs. Also, there is a case where an unpredictable large current passes during discharge. These may cause fever, smoke, break or burn.

2.2 Warning

- 2.2.1** The battery should be kept away from infants and young children. If you have swallowed the battery, please seek medical attention immediately.
- 2.2.2** Do not place the battery in a microwave or other cooking utensils. Due to the heating and electrical shock of the microwave oven, the battery may catch fire, smoke, explode or cause heat.
- 2.2.3** Do not mix with other batteries. The battery cannot be mixed with other batteries of different capacities, chemical systems or manufacturers. Do not connect other batteries or mix other batteries. The battery may catch fire, smoke, explode or cause heat.
- 2.2.4** Do not use an abnormal battery. If there are obvious abnormalities, such as odor, fever, deformity or discoloration, stop using the battery. Such batteries may be defective and may cause fire, smoke, heat or explosion if continued.
- 2.2.5** If the charging process does not end, stop charging. If the battery does not complete the charging process within the specified time, stop the charging procedure. The battery may catch fire, smoke, explode or cause heat.
- 2.2.6** Do not use a leaky battery near a flame. If the battery or the battery with the liquid flowing out produces a pungent odor, the battery should be flamed. The battery may be lit or explode.
- 2.2.7** Do not touch the leaky battery. If liquid leaking from the battery enters the eye, it will cause serious damage. If the leaked liquid enters your eyes, rinse your eyes immediately with clean water. Please consult a doctor immediately. If the liquid

stays in the eyes, it will cause serious damage.

2.2.8 To avoid short circuits or damage, tightly load the battery into a box or carton.

2.3 Precautions

2.3.1 Do not use or place the battery in a hot environment, such as in a car under direct sunlight. The battery may catch fire, smoke, explode or cause heat. At the same time, it may cause deterioration of battery performance and life.

2.3.2 The battery pack has a protective line. Do not use the battery where static electricity (more than 100V) is generated, which may damage the protection circuit. If the protection circuit of the battery is damaged, the battery may catch fire, smoke, explode or cause heat.

2.3.3 The charging temperature range is specified between 0 °C and 45 °C. Do not charge the battery outside of the specified temperature range. Failure to do so may result in heat, liquid leakage, or serious damage. In addition, it may cause deterioration of battery performance and life.

2.3.4 Please read the manual before use. Please keep this manual in a safe place for future reference.

2.3.5 Please read the charging method of the charger manual.

2.3.6 If the battery has abnormal smell, heat or rust when used for the first time, please contact the supplier.

2.3.7 Keep away from flammable materials during charging and discharging. May cause fire, smoke, explosion or fever.

2.3.8 If the electrolyte leaks from the battery and gets on clothing or skin, rinse immediately with water. Otherwise, it may irritate the skin.

2.3.9 If wires or metal objects come out of the battery, completely seal and insulate them. Otherwise, the battery may cause a short circuit, fire, smoke, explosion or heat.

2.3.10 After use, please recycle the battery according to local laws and regulations.

2.4 Warranty exemption

Suzhou Lishen is not liable for any loss caused by violation of the precautions in the specification.