Product Specification of
Huizhou YiWei Lithium Energy Co., Ltd

Document No.: LF 160-54174

Version: A / M2

Effective Date: 2020-04-01

product name:	Square aluminum shell lithium iron phosphate battery
product model:	LF160
size of product:	3.22V/160Ah
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Audit:	王华 2020.4.1
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Specification revision record

date	content	edition
2020-03-02	new issue	A/M1
2020-04-01	Modify the nominal voltage	A/M2

catalogue

1 scope of application

This standard describes the product types, basic properties, test methods and precautions for the square aluminum shell lithium iron phosphate batteries produced by Huizhou Yiwei Lithium Energy Co., Ltd. This product is suitable for vehicle power system and energy storage system.

2 product type

2.1 Product name: Square aluminum shell lithium iron phosphate battery

2.2 Model and specification: LF160

3 Nominal technical parameters

order No.	project		parameter	remarks
1	nominal capacity		160Ah	(25 ± 2) ℃, standard charge and discharge.
2	nominal voltage		3.22V	
3	Internal Resistance (1KHz)		≤0.50mΩ	
4	Standard charge and discharge	Charge / discharge current	0.5C/0.5C	(25±2) ℃
		Charge / discharge cut-off voltage	3.65V/2.5V	
5	Maximum charge / discharge current	Continuous charging / discharge	1C/1C	Reference Appendix VI: LF160-charge and discharge rate table-A/M1
		Pulse Charge / Discharge (60s)	2C/2C	
6	SOC window		10%～90%	N.A.
7	Charging working temperature		0℃～60℃	Reference Appendix VI: LF160-charge and discharge rate table-A/M1
8	Discharge working temperature		-30℃～60℃	

9	Storage temperature	Short-term (within 1 month)	-20℃～45℃	N.A.
		Long Term (within 1 year)	0℃～35℃	
10	Store humidity		＜95%	
11	Monthly self-discharge rate		Admito 3% / month	(25 ± 2) ℃, 30% to 50% S O C storage

order NO.	Project		parameter	remark
12	size	width	173.9±0.5 mm	Refer to Appendix I
13		thickness (30%-40%SOC)	54.0±1.0m m	
14		Height (Total height)	153.3±0.5 mm	
15		Height (main body height)	150.6±0.5 mm	
16		The center distance of the pole	123.0±0.3 mm	
17	Battery weight		3.00±0.10k g	

4 test condition

4.1 Test ambient condition

temperature:

(25 ± 2) °C

Relative humidity: 45%~85%

Atmospheric pressure: 86KPa ~106KPa

4.2 Standard charging

At (25 ± 2) ℃, the battery is charged at 0.5C (A) to the charging limit voltage of 3.65V and then at a constant voltage until the current is less than 0.05C (A).

4.3 Standard discharge

At (25 ± 2) ℃, the battery is continuously discharged at 0.5C (A) up to a termination voltage of 2.5V. If specifically required, the battery may discharge at 1.0C constant to a termination voltage of 2.5V.

5 Battery performance

5.1 Electric performance

order No.	project	technical requirement	test method
1	25℃ rate discharge performance	Discharge capacity / nominal capacity of 100% A) 0.5C (A) 100% B) 1.0C (A) 100%	After the battery is charged as a standard, it is shelved for 1h and discharged to 2.5V with 0.5C(A), 1.0C (A) respectively. If the discharge capacity fails to meet the technical requirements, the test is allowed to be repeated three times.
2	Different temperature discharge performance	Discharge capacity / nominal capacity of 100% A) 95% at 55℃ B) -70% at 20℃	A) After standard battery charging, it was shelved at 55 ± 2℃ for 5h and discharged to 2.5V at 1.0C (A); B) After standard battery charging, it was shelved at-20 ± 2℃ for 24h and discharged to 2.0V at 1.0C (A).
3	25℃ Charge hold with recovery capability	Remdual capacity nominal capacity 95% and restored capacity nominal capacity 97%	After standard battery charging, leave the open circuit for 28 days; discharge from 1.0C (A) to 2.5V as residual capacity, and then lay on hold for 30min after the second standard charge and discharge from 1.0C (A) to 2.5V as recovery capacity.
4	The 25- ℃ cycle life span	3,500 Times @1C / 1C	(25 ± 2) ℃, battery under a 300kgf fixture: to 1.0C (A) constant current constant voltage charge to 3.65V, cut-off current 0.05C (A), hold 30min, discharge at 1.0C (A) to 2.5V, hold 30min, proceed to the next cycle,

			To capacity decay at 80% of nominal capacity.
5	The 45- ℃ cycle life span	1,800 Times @1C / 1C	(45 ± 2) ℃, battery under a 300kgf fixture: to 1.0C (A) constant current constant voltage charge to 3.65V, cut-off current 0.05C (A), hold 30min at 1.0C (A) Power to 2.5V, put on hold for 30min, and run the next cycle until the capacity decreases to 80% of the nominal capacity.

6	Life termination management	Capacity / nominal capacity is <70%	During the use of the battery, the battery should be stopped after the specified termination of life.

5.2 Safety performance

order No.	project	technical requirement	test method
1	Over-discharge	No explosion, no fire, no fluid leakage	References: GB / T 31485-2015 Safety Requirements and Test Methods for Power Battery for Electric Vehicles
2	over-charging	No explosion, no fire	
3	short	No explosion, no fire	
4	decline	No explosion, no fire, no fluid leakage	
5	heat	No explosion, no fire	
6	crimp	No explosion, no fire	
7	Seawater immersion	No explosion, no fire	
8	temperature cycle	No explosion, no fire, no fluid leakage	
9	cyclone	No explosion, no fire, no fluid leakage	
10	Thermal runaway	No explosion, no fire	Reference: Safety Technical Conditions for Electric Bus

6 transport

The battery shall be packed in boxes under charge (30%~50%SOC) for transportation, preventing violent vibration, shock or extrusion and sun and rain during transportation.

7 keep in storage

The battery shall be stored (more than 1 month) in clean, dry and ventilated rooms with ambient temperatures of 0℃ to 35℃. The battery is charged and discharged once every 6 months to store the charge state (30% to 50% S O C).

8 matters need attention

1. When charging and discharging the battery, ensure the voltage, current and temperature monitoring and protection.

2. Please keep the battery away from the heat source, fire source and other heating properties, and corrosive environments with strong acid and alkali.

3. Do not short connect or install incorrect polarity at any time.

4. Do not mix different batteries of different models or manufacturers.

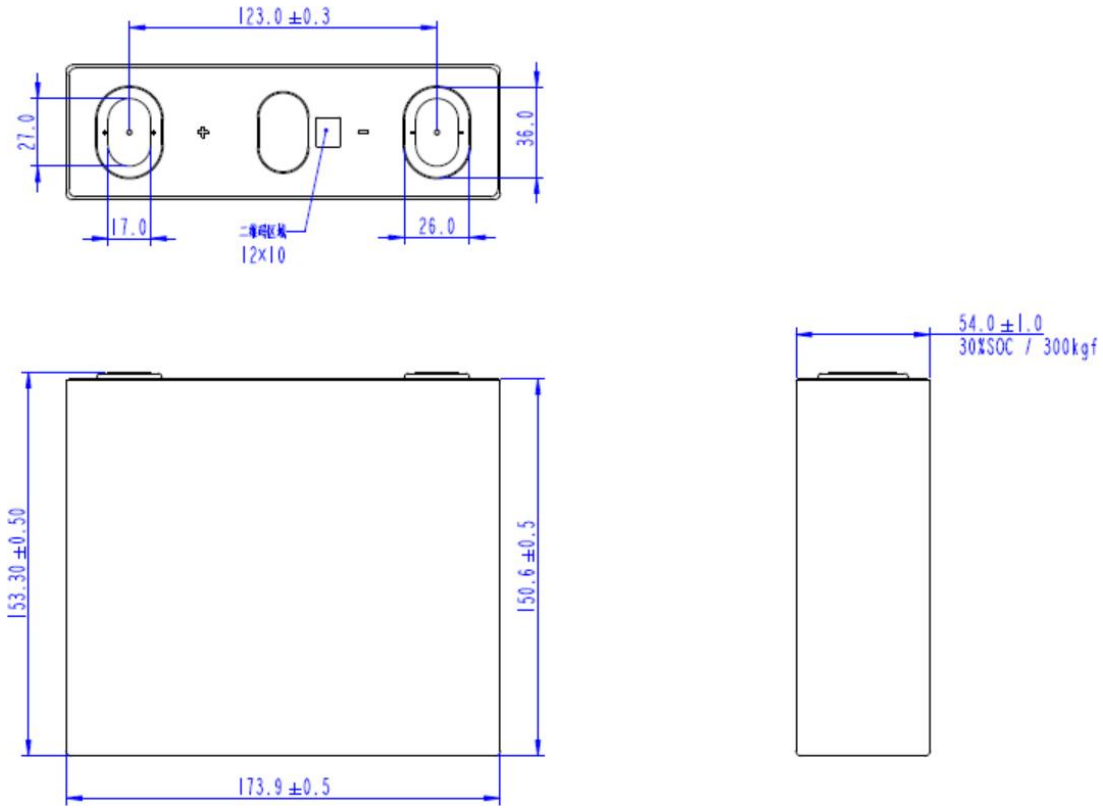
5. Do not use external force to make the battery fall, impact or puncture. Do not disassemble the battery or change the external structure.

6. When the battery is not used for a long time, please keep the battery charge at the 30%~50%SOC state, and avoid being in the strong direct sunlight or high temperature and high humidity environment.

7. Wear rubber gloves and other protective devices when operating the battery.

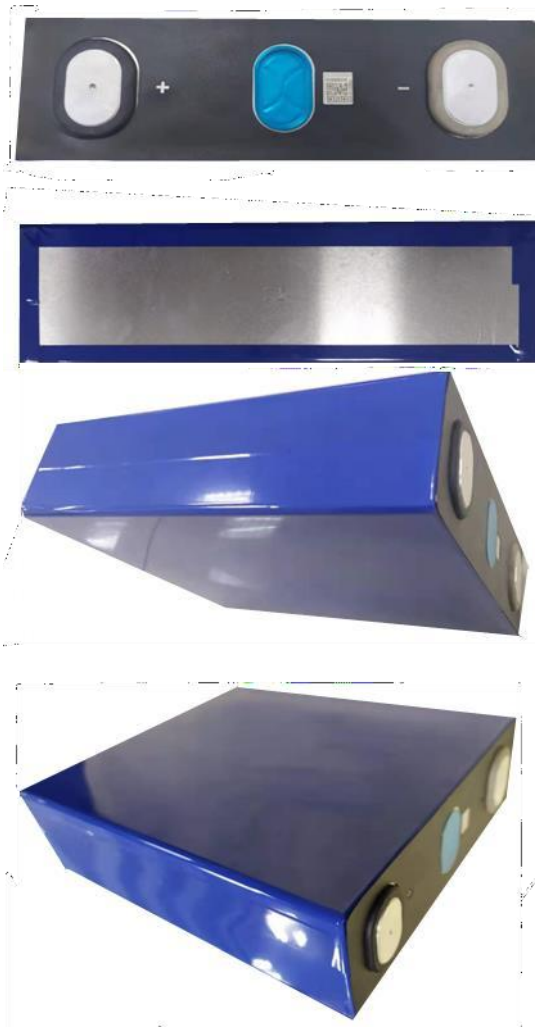
8. In case of battery leakage, smoke or damage, please stop using the battery immediately and contact our company for treatment.

Appendix I: Battery 2 D diagram

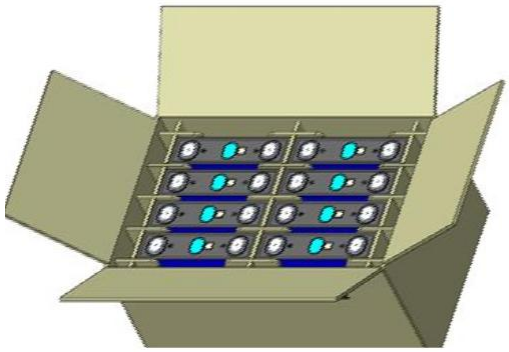


Appendix 2: Battery encoding rules

Appendix III: Photo of the battery appearance



Appendix IV: Battery packaging diagram

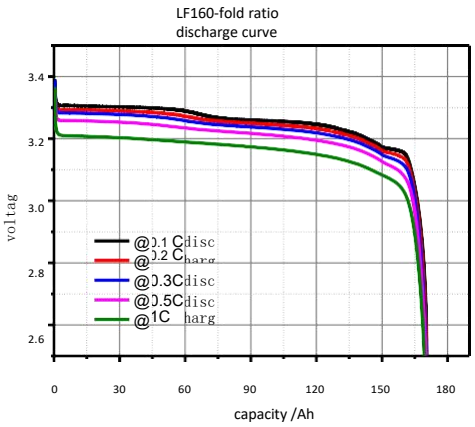


Length * width *

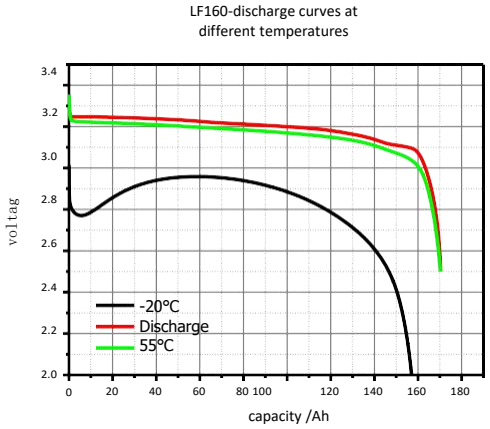
Long * width * height:

Appendix V: Electrical performance graph

1,25℃ multiplier discharge curve



2. Discharge curve of different temperatures



3. Cycle curve (1.0C charging 3.65V-2.5V)