

Lithium-ion Battery Pack Specification

Model: YS12-12

Customer			Customer Model	
Approved by	Checked by	Prepared by	Date	Version
				A0

Customer Signature

Customer Confirmed	Date

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1. Scope

This specification is applied to **YS12-12** battery

2. Product appearance

2.1 Pictures



2.2 Label:



3.Product Configuration

No.	Item	Criteria	Remark
1	Li-ion Cylindrical Cell	32700 3.2V Typical:6Ah	8PCS (4S2P)
2	PCM	LiFePO4-4S20A same port for charge and discharge	
3	Connector	T2	
4	Shell	ABS plastic case	

4.Product Specification

Table 1 :

No.	Item	Rated Performance		Remark
1	Rated Capacity	Typical	12Ah	Discharge at 0.2C after standard charge fully.
		Minimum	11.7Ah	
2	Nominal Voltage	12.8V		
3	Voltage at end of Discharge	10V		
4	Charging Voltage	14.4V±0.1V		
5	Charge Protection voltage	3.9V±0.1V		Single Section Protection Voltage
6	Discharge Protection voltage	2.0V±0.1V		Single Section Protection Voltage
7	Internal Impedance	≤50mΩ		
8	Standard Charge	Constant Current 0.5C Constant Voltage 14.4V 0.01C cut-off		
9	Standard Discharge	Constant current 0.2C end voltage 10V		

10	Maximum Charge Current	0.5C (6A)	23 ± 3°C is recommend Operation Temperature, 60±25%RH Bare Cell
11	Maximum Continuous Discharge Current	20A	23 ± 3°C is recommend Operation Temperature, 60±25%RH Bare Cell.
12	Operation Temperature Range	Charge: 0~45°C	
		Discharge: -20~60°C	
13	Storage Temperature Range	0~40°C	
14	Battery Voltage of Shipment	13.2V~13.6V	
15	Storage Humidity Range	60±25%RH.	
16	Product Dimension	L: 151 ± 3mm	Initial dimension
		W: 99 ± 3mm	
		H: 95 ± 3mm	

5. Product Performance

5.1 Standard Testing Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 20±5°C and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25~85%RH.

5.2 Measuring Instrument or Apparatus

5.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

5.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10kΩ/V

5.2.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.

5.2.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter).

5.3 Standard Charge\Discharge

5.3.1 Standard Charge :

Test procedure and its criteria are referred as follows:

Charging shall consist of charging at a 0.5C constant current rate until the cell reaches 14.4V. The cell shall then be charged at constant voltage of 14.4 Volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.01C. The cell shall demonstrate no permanent degradation when charged between 5 °C and 45 °C.

5.3.2 Standard Discharge

Cells shall be discharged at a constant current of 0.2C to 10.0Volts @ 25± 3°C

5.4 Appearance

There shall be no such defect as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

5.5 Initial Performance Test

Table 2:

Item	Measuring Procedure	Requirements
(1)Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	≥13.6V

(2) AC Impedance Resistance	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 20±5°C.	≤50mΩ
(3) Nominal Capacity	The capacity on 0.2C discharge shall be measured after standard charge at 23±2°C.	Discharge Capacity ≥12Ah

5.6 Cycle Life

Table 3 :

No.	Item	Criteria	Test Conditions
1	Cycle Life (0.5C)	Higher than 80% of the Initial Capacities of the Cells	Carry out 2000 cycles charging/ Discharging in the below condition. ◆ Charge: Standard Charge, per 5.3.1 ◆ Discharge: 0.5C to 10.0V ◆ Rest Time between charge/discharge: 30min. ◆ Temperature: 20±5°C

6.PCM Specification

6.1 Using scope: The document applies to Li-ion Battery protection module for MaxLi Battery Ltd.

6.2 Environment request: ROHS.

6.3 Function description: Over charge protection, Over discharge protection, Over current protection
 Short circuit protection

6.4 Electric features:

<i>Item</i>	parameter value	Specification
Over charge protection	Over charge protection voltage	$3.6V \pm 0.5V$
	Over charge protection delay time	$\leq 2s$
	Over charge release voltage	$3.8V \pm 0.1V$
Over discharge protection	Over discharge protection voltage	$2.0V \pm 0.1V$
	Over discharge protection delay time	$\leq 200ms$
	Over discharge release voltage	$2.5 \pm 0.1V$
Over current protection	Over current protection current	$75A \pm 10A$
	Over current protection delay time	$< 60ms$
	Release Conditions	Cut off load
Short protection	Short protection delay time	$\leq 500\mu s$
	Release Conditions	Cut off load
IR resistance	IR of PCM	B- To P- RDS $\leq 20m\Omega$
Normal current consumption	Normal current consumption of PCM	$\leq 50\mu A$
Continuous Discharge Current	Continuous Discharge Current	20A
Continuous charge Current	Continuous charge Current	20A
Discharge Protection Temperature	Discharge Protection Temperature	$75^{\circ}C$
	Release Conditions	$\leq 55^{\circ}C$ + Cut off load

7.Storage and Transportation

7.1 Storage:

7.1.1 The Li-ion battery pack should be stored in a cool, dry and well-ventilated area. and should be far from the fire and the high temperature.

7.1.2 The best Voltage in storage is **12.8V~13.6V**.

7.1.3 The battery should store in the product specification book stipulation temperature range. the best storage temp. is **0 to 40°C**. The best humidity is 60±25%.

7.1.4 If has surpasses above for 2 months the long time storage, suggested you should carry on additional charge and discharge to the battery.

7.2 Transportation

7.2.1 Do not mix the battery products with other cargo.

7.2.2 Do not immerse the battery products in water or allow it to get wet.

7.2.3 The highest temperature in transportation is lower than **50°C**.

8. Use Attentions:

To ensure proper use of the battery please read the manual carefully before using it.

8.1 Handling

8.1.1 Do not expose to, dispose of the battery in fire.

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

8.1.3 Avoid shorting the battery

8.1.4 Avoid excessive physical shock or vibration.

8.1.5 Do not disassemble or deform the battery.

8.1.6 Do not immerse in water.

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

8.1.8 Keep out of the reach of children.

8.2 Charge

8.2.1 Battery must be charged in appropriate charger only.

8.2.2 Never use a modified or damaged charger.

8.2.3 Do not leave battery in charger over 24 hours.

8.2.4 Charging current: Can not surpass the biggest charging current which in this specification book stipulated.

8.2.5 Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.

9.2.6 Charge temperature: The battery must carry on the charge in the ambient temperature scope which this specification book stipulated.

8.2.7 Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery.

8.3 Discharge

8.3.1 The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the over sized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat.

8.3.2 Electric discharge temperature: The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.

8.3.3 Over-discharges: After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

8.4 Disposal: Regulations vary for different countries. Dispose of in accordance with local regulations.

9. Period of Warranty

There is a Three years warranty for our export batteries from the date of shipment. If the problem happened during the warranty period, we are responsible to replace the defective ones according to the accurate analysis results. However, we won't take any responsibility if the problem is caused by the battery-related applications and related products.

10. Others

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time 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 or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

11. Note

Any other items which are not covered in this specification shall be agreed by both parties.