



LiFePO ₄ Rechargeable Battery Pack Specifications			
Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 4, 2019	Page	1/10

LiFePO₄ Rechargeable Battery Pack

Specifications

MODEL: LYS8715093-12SP

LYANG

Approved	Checked	Prepared

Customer

Approved	Checked	Received

LYANG ENERGY TECHNOLOGY (DONG GUAN) CO., LTD.

Fulong first industrial park, Shipai Town Dongguan City,

Guangdong, 523349 China.

Tel: 0769-86538962

Fax: 0769-86538971



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	2/10

Contents

1. Scope	p. 3
2. Product and Model Name	p. 3
2-1 Product	p. 3
2-2 Model Name	p. 3
3. Ratings	p. 3
4. Dimensions and Appearance	p. 3
4-1 Dimensions	p. 3
4-2 Appearance	p. 4
5. Test Conditions and Initial Performance Test	p. 4
5-1 Standard Test Conditions	p. 4
5-2 Measuring Instruments / Apparatus	p. 4
5-3 Standard Charge	p. 4
5-4 Rest Period	p. 4
5-5 Initial Performance Test	p. 5
6. Discharge Characteristics	p. 5
6-1 Standard Discharge Capacity	p. 5
6-2 Discharge Rate Capabilities	p. 5
6-3 Temperature Dependence of Discharge Capacity	p. 5
6-4 Temperature Dependence of Charge Capacity	p. 5
6-5 Cycle Life	p. 6
6-6 Storage Characteristics	p. 6
6-7 Discharge Curves	p. 6
6-8 Charge Curves	p. 6
7. Mechanical Characteristics	p. 7
8. Safety Performance	p. 7
9. Handling Instructions	p. 8
10. Shipment	p. 9
11. Amendment of this specification	p. 9
Fig 1. Drawing of LYS8715093-12SP	p. 10



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	3/10

1. Scope

- 1-1 This document describes the Product Specification of the LiFePO₄ rechargeable battery
- 1-2 This Specification is applied to motorcycle starter battery product
- 1-3 The battery specification is listed for the LYS8715093-12SP (12 V # 7A battery)

2. Product and Model Name

- 2-1 Product : LiFePO₄ Rechargeable Battery Pack
- 2-2 Model Name : LYS8715093-12SP

3. Ratings

3-1	Battery Model	LYS8715093-12SP (12.8 V # 7A)
3-2	Battery Manufacturer	LanYang Energy Technology
3-3	Battery Capacity	Min. 5.0 Ah (1hr)
3-4	Internal Impedance	15 ± 2 mΩ
3-5	Dimension	150.0 mm x 87.0 mm x 93.0 mm
3-6	Weight	Approx. : 1.3 kg
3-7	Charging Voltage	14.6 ± 0.5 V
3-8	Nominal Voltage	12.8 V
3-9	Discharge End Voltage	10.0 ± 0.5 V
3-10	Charging Current	Std : 2.5 A (0.5 C) / Max : 5.0 A (1 C)
3-11	Discharging Current	Std : 5.0 A (1 C) / Max : 50 A (10 C) Pulse : 200 A (40 C) 3 sec. > 6.5V
3-12	Operating Temperature	Charging : -20 ~ +45 °C Discharging : -20 ~ +80 °C
3-13	Storage Temperature	-10 ~ +40 °C
3-14	Cycle Life	15,000 times of starting or 2 years

4. Dimensions and Appearance

4-1. Dimensions

See the attached drawing of LYS7111494-12SP (Fig.1)



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	4/10

4-2. Appearance

There will be no defects such as scratch, flaw, crack, rust and leakage, which may adversely affect the cell commercial value.

5. Performances

5-1 Standard Test Conditions

Performance tests should be conducted with new cells within one month after the shipment from LYANG factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, tests and measurements shall be done under the temperature of 25 ± 2 °C and the relative humidity of 45 ~ 85 % RH. However, the test results are not affected evidently by such conditions of temperature 15 ~ 30 °C or humidity 25 ~ 85 %RH.

5-2 Measuring Instruments or Apparatus

5-2-1 Dimension Measuring Instruments

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

5-2-2 Voltmeter

Standard class specified as the national standard or more sensitive class having inner impedance more than 10 MΩ

5-2-3 Ammeter

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

5-2-4 Impedance Meter

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

5-3 Standard Charge

Test procedure and its criteria are referred as follows : 1C mA = 5000 mA

Fully charged condition : CC-CV, 0.2C mA/14.6V, 0.01C mA cut-off current, 25 ± 2 °C.

5-4 Rest Period

Unless otherwise defined, 10 min. rest period after charge and 10 min. rest period after discharge



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	5/10

5-5 Initial Performance Tests

Item	Measuring Procedures	Requirements
(1) Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	≥ 12.8 V
(2) Internal Impedance	The Impedance shall be measured in an alternating current method (1 kHz LCR meter) after standard charge at 25 ± 2°C.	≤ 17mΩ
(3) Minimum Capacity	The capacity on 0.5C mA discharge shall be measured after standard charge at 25 ± 2°C.	≥ 5000 mAh

6. Discharge Characteristics

6-1 Standard Discharge Capacity

The standard discharge capacity is the initial discharge capacity of the cell, which is measured with discharge current of 0.5C mA with 10.0 V cut-off at 25 °C within 30 min after the standard charge.

Standard Discharge Capacity ≥ 5000 mAh

6-2 Discharge Rate Capabilities

Discharge capacity is measured with the various currents listed in the following table and 10.0 V cut-off voltage after the standard charge.

Discharge Condition			
Current	0.5C	3C	5C
Capacity /mAh	≥ 5000	≥4700	≥ 4500

6-3 Temperature Dependence of Discharge Capacity

Discharge capacities at different temperatures are measured with discharge current 0.2C mA and 10.0 V cut-off voltage after the standard charge has been done.

Charge Temp.	Discharge Temp.				
25 °C	-20 °C	-10 °C	0 °C	20 °C	60 °C
Relative Capacity	45%	60%	80%	98%	99%

6-4 Temperature Dependence of Charge Capacity

Charge capacities at different temperatures are measured with charge current 0.2C mA and 14.6 V cut-off voltage after the standard discharge has been done.

Discharge Temp.	Charge Temp.		
25 °C	0 °C	25 °C	45 °C
Relative Capacity	95%	100%	100%



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	6/10

6-5 Cycle Life

Charge conditions : CC-CV, 1C mA to 14.6 V and 0.01C mA cut-off, rest 10 min

Discharge conditions : Constant current 1C mA and 10.0 V cut-off, rest 10 min

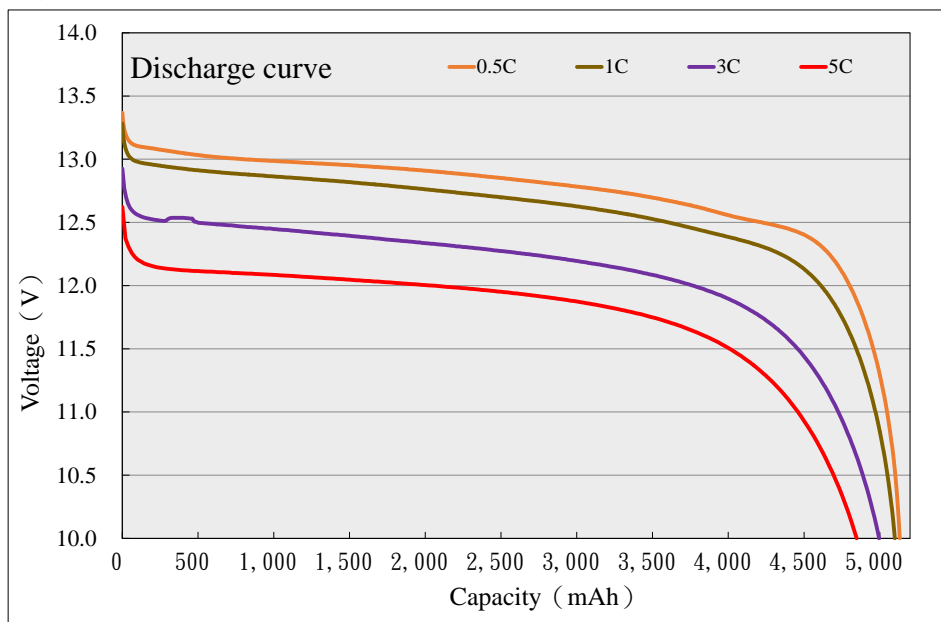
After 1000 cycle, remaining capacity \geq 80% of the standard capacity and at 25 °C

6-6 Storage Characteristics

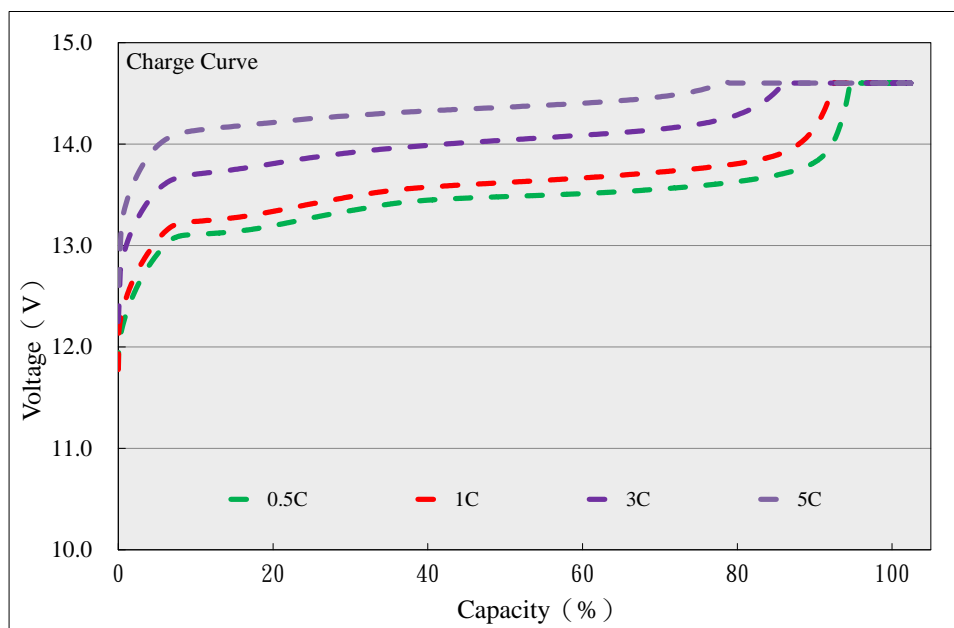
Capacity, after storage for 30 days at 25 °C after the rated charged, measured with discharge current 0.2C mA with 10.0 V cut-off and at 25 °C

Retention capacity (after the storage) \geq 90% of the standard capacity

6-7 Discharge Curves



6-8 Charge Curves (reference only)





LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	7/10

7. Mechanical Characteristics

Item	Test Method	Requirements
Vibration Test	After standard charge, the cell is to be tested as following conditions: Amplitude : 0.8 mm Frequency : 10 ~ 55 Hz (sweep : 1 Hz/min) Direction : X/Y/Z axis for 90 ~ 100 min. The cell is to be tested in three mutually perpendicular to each axis.	No fire, no explosion
Drop Test	Drop the cell in the shipment condition (fully charged) from 1m height onto 5 cm or thicker concrete with p-tile on it 3 times each of X, Y, and Z directions at 25 ± 2 °C	No fire, no explosion, no smoking

8. Safety Performance

Item	Test Method	Requirements
Short-Circuit Test	After standard charge, the cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance load of 0.1 Ω.	No explosion, no fire.
Heating Test	A cell is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of 5 ± 2 °C /min to a temperature of 130 ± 2 °C at which temperature the oven is to remain for 30 minutes before the test is discontinued.	No explosion, no fire.
High Temp. Test	Leaving the cell at 85 °C for 4 hours after standard charge.	No explosion, no fire. Recovery capacity ≥ 80%
Abnormal Charging Test	After standard charge, the cell is subjected to a charging current by connecting it in opposition to a dc-power supply. The beginning current is 3.0C mA, which is to be obtained by connecting a resistor of specified size and rating in series with the cell, the voltage of the dc-power supply is 4.8 V. The test time is 2.5 hours. This does not require that the initial I _c be maintained for 2.5 hours.	No explosion, no fire.



LiFePO ₄ Rechargeable Battery Pack Specifications			
Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	8/10

9. Handling Instructions

Read and observe the following warnings and precautions to ensure correct and safe use of LiFePO₄ Rechargeable Battery Pack



Failure to observe the following precautions may result in battery damages or external short circuit which may cause fire.

- Do not place the pack in a microwave oven or pressurized container.
- Do not immerse the pack in water or allow it to get wet.
- Do not use or store the pack near sources of heat such as a fire or heater.
- Do not use any chargers other than those recommended by LYANG.
- Do not reverse the positive (+) and negative (-) terminals.
- Do not connect the pack directly to wall outlets or car cigarette-lighter sockets.
- Do not put the pack into a fire or apply direct heat to it.
- Do not short-circuit the pack by connecting wires or other metal objects to the positive (+) and negative (-) terminals.
- Do not carry or put the pack together with necklaces, hairpins or other metal objects.
- Do not strike, throw or subject the pack to sever physical shock.
- Do not pierce the pack casing with a nail or other sharp object, break it open with a hammer, or step on it.
- Do not directly solder the pack terminals.
- Do not attempt to disassemble or modify the pack in any way.
- Do not recharge the pack I near a fire or in extremely hot conditions.
- Do not use the pack if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the pack is in use or being recharged, remove it from the device or charger immediately and discontinue use.
- Do not use the pack in combination with primary pack (such as dry pack) or packs of different capacity, type or brand.



Failure to observe the following precautions may result in battery damages which can cause body or eye injury.

- Keep the pack out of the reach of children.
- If the pack leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.
- If the pack leaks and electrolyte gets your skin or clothing, immediately rinse the affected area with clean running water. If left as is, skin inflammation can occur.



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	9/10



- Do not use or store the pack where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the pack may be overheated. This can also reduce pack performance and/or shorten service life.
- Use the pack only under the instructed environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the cell outside of these temperatures can cause the pack to overheat, reduce pack performance and/or shorten service life.
- In cases where children use the pack, instruct them on the contents of the user's guide and keep an eye on them to ensure that the pack is being used correctly.
- For directions on pack installation and removal, read the instruction manual that accompanies the equipment in which the pack will be used.
- If a device is not used for an extended period, the pack should be removed and stored in a cool, dry place. Otherwise, resting or reduced performance may occur.
- If the terminals of the pack are dirty, wipe them clean with dry cloth before use. Otherwise, solid electrical contact may not be charged with the equipment, and this can cause power outages or failure of charging.

10. Shipment

Partial charged condition.

11. Amendment of this Specification

This specification is subject to change without prior notice.

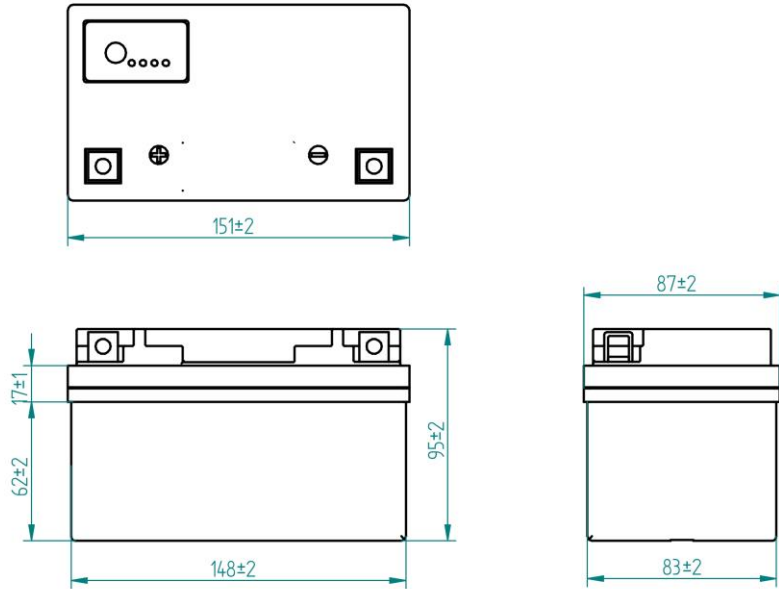
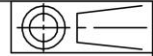
Fig 1. Drawing of LYS7111494-12SP



LiFePO₄ Rechargeable Battery Pack Specifications

Model	LYS8715093-12SP	File No	LY-ER-026-A5
Date	July 04, 2019	Page	10/10

表单编号:LY-ER-016 版本:A2



文件编号:	
图名	12V7號電池尺寸
P/N	
材质	比例
版本	单位 mm
绘图	兰阳能源科技 (东莞)有限公司
审核	
批准	

1. Case material : PP
2. Unit : mm
3. Tolerance : ±2mm