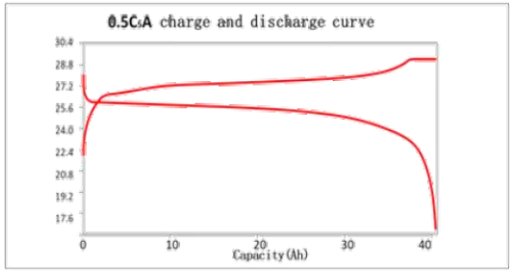
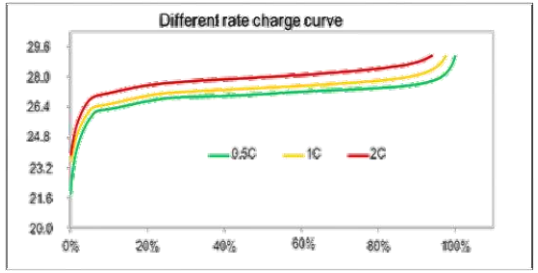
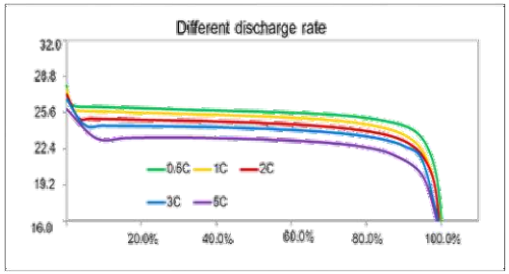
ZWAYN ENERGY
Green Power

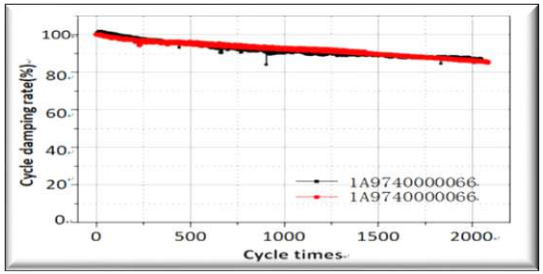
STREET LIGHT BATTERY

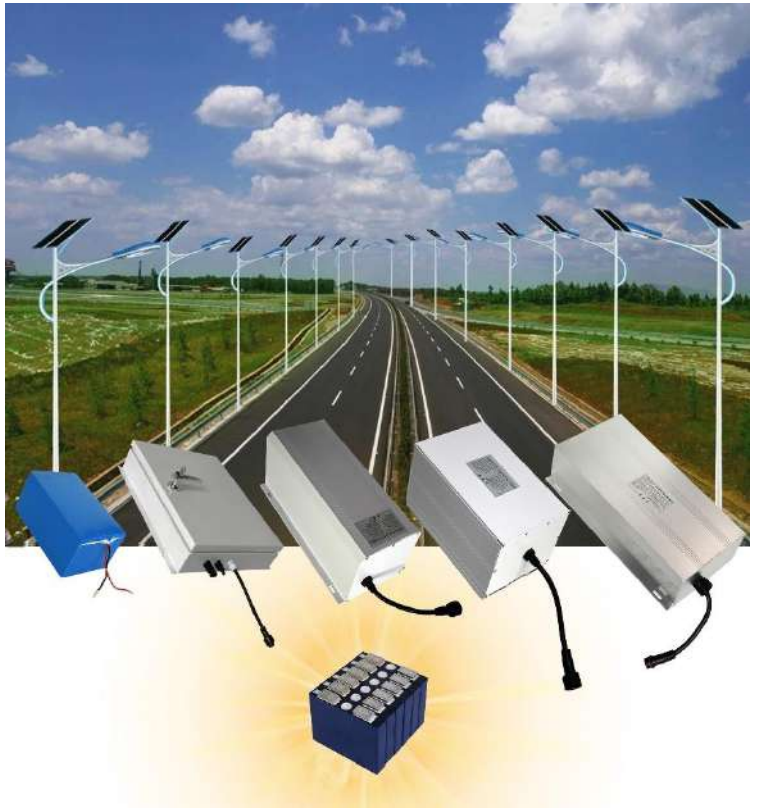
※Electrical performance











※Application:


Solar Street Light


Square Solar Light

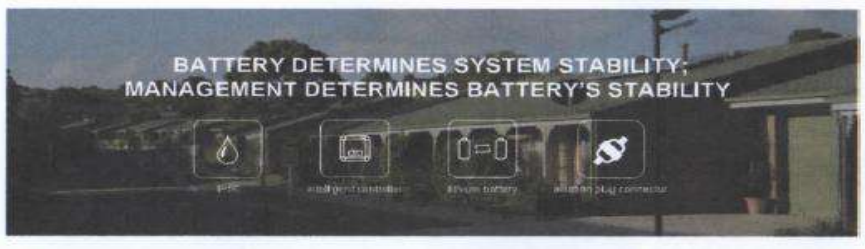

Park Solar Light


Residential Solar Light

LiFePo4 Lithium-ion Battery

ZWN-2440 is an energy storage module with Lithium Iron Phosphate Battery Cell. It is widely used in solar street lights power supply system. It has a long cycle life with more than 2000 cycles @ 80% DOD, 35℃, Working Temperature has a wide range, -20℃ - 60℃.It has a small dimension and is easy to install in the system, the battery management system (BMS) is internally installed in the battery for safety use.

ZWAYN ENERGY
Green Power



※Battery Specification

STREET LIGHT BATTERY SL-2440			
Item	**Unit**	**Value**	**Remark**
Cell Model	—	LFP2614897 40Ah 3.2V	Prismatic
Combination Mode	—	1P8S	
Nominal Capacity	Ah	40	
Rated Energy	Wh	1024	
Initial Internal Resistance	mΩ	<80	AC1KHz
Rated Voltage	V	25.6	
Charge Ending Voltage	V	29.2	Cell≥3.65V
Discharge Ending Voltage	V	19.2	Cell≤2.4V
Standard Charge Current	A	8	0.2C
Max. Charge Current	A	≤15	
Standard Discharge Current	A	8	
Max. Discharge Current	A	≤15	
Operating Temperature	℃	-10℃ - +45℃	Charge
		-20℃ - +60℃	Discharge
Delivery Voltage	V	25.6 - 27.2	
Shell Type	—	PVC+Epoxy Resin Plate	
Weight	kg	8 + 0.5kg	Approx.
Physical Dimensions	mm	222(L)×149(W)×110(H)	

※Features and Advantage:

1. Lower Cost, Competitive price
2. Safety, Triple Levels protection (Cells,BMS and thermal fuse)
3. Longer cycle life, EV grade cells, usable life 5 Years
4. Longer c, EV grade cells, Support customize
5. Delivery fast, support air and sea shipping

※Triple Levels Protection:

Cell level: LifePO4 most safety Li-ION Cells with exhaust valve

BMS with over current/voltage/charge/discharge/load/heat protection

Additional thermal fuse and 28A fuse

ZWAYN ENERGY
Green Power

※Cell Specification

ZWN- LFP2614897 40Ah 3.2V			
Item	**Unit**	**Value**	**Remark**
Cell Model	—	LFP2614897 40Ah 3.2V	Prismatic
Nominal Capacity	Ah	40	
Rated Energy	Wh	128	
Initial Internal Resistance	mΩ	<1.0	AC1KHz
Rated Voltage	V	3.2	
Charge Ending Voltage	V	3.65	
Discharge Ending Voltage	V	2.0	
Standard Charge Current	A	20	0.5C
Max. Charge Current	A	≤40	
Standard Discharge Current	A	20	
Max. Discharge Current	A	≤40	
Operating Temperature	℃	-10℃ - +45℃	Charge
		-20℃ - +60℃	Discharge
Delivery Voltage	V	3.2 – 3.4	
Shell Type	—	Metal	
Weight	kg	0.84-0.90kg	Approx.
Physical Dimensions	mm	27(T)×148(W)×103(H)	

ZWAYN ENERGY
Green Power

QUALITY MANAGEMENT SYSTEM CERTIFICATION

Dongguan ZWAYN New Energy Co.,Ltd

Registration No：CACQ19Q00043R0

Organization Code：91441900MA5180U95E

Registration Address：4 floor,NO.12, Minyi Road, Wusha Industrial Zone, Changan, Dongguan, Guangdong, China P.C:523850

Audition Address：4 floor,NO.12, Minyi Road, Wusha Industrial Zone, Changan, Dongguan, Guangdong, China P.C:523850

Is in conformity with：GB/T19001-2016 idt ISO9001:2015

This certificate is covering the following scope: Energy storage system, lithium battery pack, portable power supply, street lamp lithium battery, photovoltaic energy storage system research and development and production (except products involving administrative license)

Issue Date：2019-04-22 Expiry Date：2022-04-21

First Issue Date：2019-04-22

General Manager: 关仁傑

ZHONGCHANGAN CERTIFICATION CENTER (SHENZHEN) CO., LTD.

This certificate shall be subject to at least two supervisory reviews within the validity period of 3 years after its issue.
The certificate's immediate validity can be accessed at www.cacq.org.cn
Information on this certificate is available on the official website of the National Accreditation and Monitoring Board(www.cnca.gov.cn). Can also scan the lower right corner of the code query

Address: Room 1050, Fuhong Plaza, 120 Yongfu Road, Qiaotou Community, Fuhai Sub-district, Bao'an District, Shenzhen City

ZWAYN ENERGY
Green Power

Producer : **Dongguan Zwayn New Energy Co., Ltd.**

DBID : 377590 and Audit Id : 147617 Audit Date : 04/04/2019
Audit Type : Full Audit

amfori BSCI
Trade with purpose

Auditee :	**Dongguan Zwayn New Energy Co., Ltd.**
Audit Date From :	**04/04/2019**
Audit Date To :	**04/04/2019**
Expiry Date of the Audit :	**Please refer to the producer profile in the amfori BSCI platform**
Auditing Company :	**BureauVeritas**
Auditor's Name(s) :	**Dawn Xie(Lead)**
Auditing Branch (if applicable) :	

amfori BSCI
Trade with purpose

This is an extract of the on line Audit Report.The complete report is available in the amfori BSCI Platform.
Access www.bsciplatform.org, for entitled users only.

CMA 160008222171

ilac-MRA CNAS

中国认可
国际互认
检测
TESTING
CNAS L0095

No.: GJW2019-1218-3

TEST REPORT

NAME OF SAMPLE: Lithium Ferro Phosphate (LiFePO4) Battery

CLIENT: Dongguan ZWAYN New Energy Technology Co., Ltd

CLASSIFICATION OF TEST: Commission test

威凯检测技术有限公司
Vkan Certification & Testing Co.,Ltd.

TEST REPORT

Name of product: Lithium Ferro Phosphate (LiFePO4) Battery	Trade mark: —
Type/Model: ZWN-2440F 25,6V 40Ah ,	Sample status: The sample's statue is good.
Manufacturer: Dongguan ZWAYN New Energy Co., Ltd	Commissioned by: Dongguan ZWAYN New Energy Co., Ltd
Manufacturer address: —	Commissioner address: 4/F, No. 12, Min Yi Road, Wu Sha Community, Changan Town, Dongguan City
Quantity of sample: 2 pcs	Sampled by: —
Sample identification: A1# A2#	Sampling at (place): —
Means of receiving: Submitted by commissioner	Means of sampling: —
Classification of test: Commission test	Sampling date: —
Receiving date: 2018-10-20	Completing date: 2019-12-18
Tested according to: IEC 62620: 2014	Test item: 2 items

Test conclusion:

The Lithium Ferro Phosphate (LiFePO4) Battery submitted by Dongguan ZWAYN New Energy Co., Ltd are tested according to IEC 62620:2014 Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary Lithium cells and batteries for use in industrial applications.

Test items: Discharge performance at 25℃ and endurance in cycles

The results of the above items comply with the relevant requirements of IEC 62620:2014.

Seal of CVC

Date of issue:2019.12.18

Approved by: Reviewed by: Tested by:

Description and illustration of the sample:
The samples' status is good.
The rating of battery A1# is 25.6V 40Ah, 8s1p.
The rating of battery A2# is 25.6V 40Ah, 8s1p
The component cells LFP-2614897-40Ah of both battery packs are all the same, and the rating is 3,2V 40Ah.
The MSDS information of battery packs is listed as table 1.
The charging temperature of Lithium Ferro Phosphate (LiFePO4) Battery is 0℃~+55℃
The discharging temperature of Lithium Ferro Phosphate (LiFePO4) Battery is -20℃~+60℃.

Table 1 MSDS information of Lithium Ferro Phosphate (LiFePO4) Battery

组成部件 Component Parts	主要成分 Main Component	含量（%） Rating（%）	CAS 编号 CAS No.	备注 Remark
外壳（Container）	钢		SUS304	
正极（Anode）	$LiFePO_4$		15365-14-7	
	碳（包覆）	1.5-6.0%	/	
负极（Cathode）	铜箔	>99.5%	7782-42-5	
	其它	<0.5%	/	
电解液（Electrolyte）	碳酸酯	70-80%	/	
	LiPF6	0-20%	21324-40-3	
	添加剂	0-10%	/	
铅 Lead			7439-92-1	
镉 Cadmium			7440-43-9	
汞 Mercury			7439-97-6	

Description of the sampling procedure:
A#1 sample status is good.
A#2 sample status is good.

Description of the deviation from the standard, if any:

According to the Commissioner's requirements, the charge/discharge rate is 0.5C（20A）based on battery.

Remarks:

Throughout this report a comma is used as the decimal separator.

Photos and markings

25.6V 40Ah

LIFE BATTERY

ZWN-2440F

Nominal Voltage	:	25.6 V
Nominal Current Capacity	:	40 Ah
Charging Voltage	:	28.8 V ± 0.05 V
Recommended Charging Current	:	20A (Max : 1C)
Life Time	:	2000 Cycle (@DOD 100%)
Cut Off Discharge Voltage	:	21 V
Working Temperature	:	-10 ~ +50 °C

DO NOT SHORT CIRCUIT

RECHARGE AFTER USE

Photos and markings

IEC 62620: 2014			
Clause	Requirements	Result	Verdict
6	**Electrical tests**		-
6.2	**Charging procedure for test purposes**		
	Prior to charging ,the cell or battery shall be discharged at 25℃±5℃ at a constant current of 1/n *It*A, down to a specified final voltage. Unless otherwise stated in this standard, cells or batteries shall be charged, in an ambient temperature of 25℃±5℃, using the method declared by the manufacturer.	At 25℃±5℃, 0,5I_t A constant current discharge to 20.0V . At 25℃±5℃, 0,5I_t A constant current charge to 28.8V, then constant voltage charge till charged current declines to 0,05CA;	-
6.3	**Discharge performance**		-
6.3.1	**Discharge performance at +25℃**		
	Setp 1-The cell or battery shall be fully charged in accordance with 6.2. Setp 2-The cell or battery shall be stored in an ambient temperature of 25℃±5℃, for not less than 1h and not more than 4h. Setp 3- The cell or battery shall then be discharged in the same ambient temperature and as specified in Table 2 to the final voltage specified by the manufacture in 6.2. Setp 4-The capacity(Ah), delivered during step3, shall not be less than that specified for this characteristic in Table 2.	The discharge rate type E is declared by the manufacturer Rated Capacity:25.6V 40Ah A1# The first discharge capacity is 40,74Ah; Rated Capacity:25.6V 40Ah A2# The first discharge capacity is 40,80Ah;	P
	The capacity delivered shall not be less than that specified for this characteristic in Table 2.		
6.6.1	**Endurance in cycles**		
	The cell or battery shall be discharged and charged according to 6.2, after completing 500 cycles, the capacity shall be measured.	According to the Commissioner's requirements, the charge/discharge rate is 0.5C（20A）based on battery., and the cycle number is 2000 cycles, the samples are on the cycling and the result will be shown after the test. The sample is on good cycling status now.	N/A
	The capacity of the cell or battery shall not be less than 60% of the rated capacity after 500 cycles.		
	The charge recovery value which is the value of the discharge capacity obtained shall be not less than 90% of the rated capacity		

注 意 事 项
Important

1. 本报告无检测单位印章无效。
   The test report is invalid without the official stamp of CVC.
2. 未经本试验室书面同意，不得部分地复制本报告。
   Nobody is allowed to photocopy or partly photocopy this test report without written permission of CVC.
3. 本报告无批准人、审核人及鉴定人签名无效。
   The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
4. 本报告涂改无效。
   The test report is invalid if altered,
5. 对检测报告若有异议，应于收到报告之日起十五天内向检测单 位提出。
   Objections to the test report must be submitted to CVC within 15 days,
6. 本报告仅对送检样品负责。
   The test report is valid for the tested samples only.
7. 判定栏中"-"表示"不需要判定"，"P"表示"通过"，"F"表示"不通过"，"N/A"表示"不适用"。
   As for the Verdict, "-" means "no need for judgement", "P" means "pass"， "F" means "fail" and "N/A" means "not applicable".

地 址：中国 广州市科学城开泰大道天泰一路 3 号
Address: No.3,Tiantaiyi Road,Kaitai Avenue,Science City,Guangzhou P. R. China.
电 话(Tel)：020 32293888
传 真(FAX)：020 32293889
邮政编码(Post Code)：510663
E-mail： office@cvc.org.cn
http://www.cvc.org.cn