

TEST REPORT

Applicant's name : Changzhou Positive Energy Electrical Equipment Co., Ltd.

Address : NO.12-2 Meihua Road, Zhonglou District, Changzhou, Jiangsu, 213000

Product Name : CLASS 2 POWER SUPPLY

Model (s) : ZNL-V120050

Testing Laboratory : Shenzhen DACE Testing Technology Co., Ltd.

Address : 102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan, Bao'an District, Shenzhen, Guangdong, China

Test Date : Mar. 31, 2024 – Apr. 02, 2024

Date of Report : Jun. 03, 2024

Report No. : DACE240327011RL258

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Revision History Of Report

Version	Description	REPORT No.	Modified information
A0	Original	DACE240327011RL258	None

TEST REPORT

Appliance Efficiency Regulations California Code Products with Battery Charging Systems (BCS)

Report Reference No. : DACE240327011RL258

Tested by (+ signature) : Parker Chen

Approved by (+ signature) : Calvin Chen

Date of issue : Jun. 03, 2024

Testing laboratory

Applicant's name : Shenzhen DACE Testing Technology Co., Ltd.

Address : 102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan, Bao'an District, Shenzhen, Guangdong, China

Testing location : Same as above

Client

Name : Changzhou Positive Energy Electrical Equipment Co., Ltd.

Address : NO 12-2, Meihua Road, Zhonglou District, Changzhou, Jiangsu, 213000

Test specification:

ENERGY STAR® Program Requirements for Products with Battery Charging Systems (BCSs)

Standard : & Appliance Efficiency Regulations California Code, Title 20, Sections 1601-1608, CEC-400-2014-009-CMF, in conjunction with 10 CFR Section 430.23(aa) (Appendix Y to Subpart B of Part 430)

Test procedure : CEC Attestation

Test Report Form No. : ESBCSA

Master TRF : 2022-10

Test item

Product Name : CLASS 2 POWER SUPPLY

Trade Mark : ZNL

Model(s) : ZNL-V120050

Ratings : Input: 100-240V~, 50/60Hz, 0.5A

Battery: 12V, 7Ah, 84Wh

Manufacturer's name : Changzhou Positive Energy Electrical Equipment Co., Ltd.

Address : NO.12-2 Meihua Road, Zhonglou District, Changzhou, Jiangsu, 213000



General product information:

Only one type battery tested –12V/7Ah Lead Acid battery as provided by the applicant. The report included the testing of charge 1 battery condition.

Conclusion: According to this report, the product used with 12V/7Ah Lead Acid battery can meet the energy efficiency standard set out in CEC regulation for battery charger system.

Product Details

1. End-Use Product Type: Product battery
2. Battery Chemistry
☐ Nicad ☐ Lithium Ion ☐ NiMH ☒ Lead Acid ☐ VRLA ☐ Others
3. Indicate battery charger type
☐ Large battery charger system
☒ small battery charger system
☐ Inductive battery charger
☐ Battery backup and Uninterruptible Power Supplies
☐ Multi-port Charger
☐ Multi-voltage Charger
☐ Multi-capacity Charger
☐ à la carte charger
4. Number of Charger ports: one port battery system
5. Compatible battery chemistries: Lead acid battery

Basic data on the battery

Manufacturer: LONG WAY

Model: 6FM7

Charge limit voltage: 15.0Vdc

Nominal Voltage: 12Vdc

Rated charge capacity of tested battery: 7Ah

Rated charge energy of tested battery: 84Wh

Electronic Code of Federal Regulations Title 10, Appendix Y to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Battery Chargers

Name of measured or calculated value	Reference
1. Duration of the charge and maintenance mode test	Section 3.3.2.
2. Battery Discharge Energy	Section 3.3.8.
3. Initial time and power (W) of the input current of connected battery	Section 3.3.6.
4. Active and Maintenance Mode Energy Consumption	Section 3.3.6.
5. Maintenance Mode Power	Section 3.3.9.
6. 24 Hour Energy Consumption	Section 3.3.10.
7. Standby Mode Power	Section 3.3.11.
8. Off Mode Power	Section 3.3.12.
9. Unit Energy Consumption, UEC (kWh/yr)	Section 3.3.13.

Similar to the previous proposal, a charger's UEC is calculated using one of the two equations shown below. If a BC is tested and its charge test duration (minus 5 hours) exceeds the threshold charge time listed in table 1 below, equation (ii) is used to calculate UEC. If not, equation (i) is used.

$$(i) \text{ UEC} = 365(n(E_{24} - 5P_m - E_{batt})24/t_{cd} + (P_m(t_{a\&m} - (t_{cd} - 5)n) + (P_{sb}t_{sb}) + (P_{off}t_{off})))$$

$$(ii) \text{ UEC} = 365(n(E_{24} - 5P_m - E_{batt})24/(t_{cd} - 5) + (P_{sb}t_{sb}) + (P_{off}t_{off}))$$

Where:

E_{24} = 24-hour energy as determined in section 3.3.10 of this appendix,

E_{batt} = Measured battery energy as determined in section 3.3.8 of this appendix,

P_m = Maintenance mode power as determined in section 3.3.9 of this appendix,

P_{sb} = Standby mode power as determined in section 3.3.11 of this appendix,

P_{off} = Off mode power as determined in section 3.3.12 of this appendix,

t_{cd} = Charge test duration as determined in section 3.3.2 of this appendix, and

$t_{a\&m}$, n , t_{sb} , and t_{off} , are constants used depending upon a device's product class and found in the following table 3.3.3:

Table 3.3.3—Battery Charger Usage Profiles

Product class				Hours per day***			Charges (n)	Threshold charge time*
Number	Description	Rated battery energy (ebatt)**	Special characteristic or battery voltage	Active + maintenance (ta&m)	Standby (tsb)	Off (toff)	Number per day	Hours
1	Low-Energy	≤5 Wh	Inductive Connection****	20.66	0.10	0.00	0.15	137.73
2	Low-Energy, Low-Voltage	<100 Wh	<4 V	7.82	5.29	0.00	0.54	14.48
3	Low-Energy, Medium-Voltage		4-10 V	6.42	0.30	0.00	0.10	64.20
4	Low-Energy, High-Voltage		>10 V	16.84	0.91	0.00	0.50	33.68
5	Medium-Energy, Low-Voltage	100-3000 Wh	<20 V	6.52	1.16	0.00	0.11	59.27
6	Medium-Energy, High-Voltage		≥20 V	17.15	6.85	0.00	0.34	50.44
7	High-Energy	>3000 Wh		8.14	7.30	0.00	0.32	25.44

*If the duration of the charge test (minus 5 hours) as determined in section 3.3.2 of appendix Y to subpart B of this part exceeds the threshold charge time, use equation (ii) to calculate UEC otherwise use equation (i).

**Ebatt = Rated battery energy as determined in 10 CFR part 429.39(a).

***If the total time does not sum to 24 hours per day, the remaining time is allocated to unplugged time, which means there is 0 power consumption and no changes to the UEC calculation needed.

****Inductive connection and designed for use in a wet environment (e.g. electric toothbrushes).

TABLE I-1—ENERGY CONSERVATION STANDARDS FOR BATTERY CHARGERS

[Compliance starting June 13, 2018]

Product class	Product class description	Battery energy	Special characteristic or battery voltage	Adopted standard as a function of battery energy (kWh/yr)
1	Low-Energy	≤5 Wh	Inductive Connection in Wet Environments.	3.04
2	Low-Energy, Low-Voltage	<100 Wh	<4 V	0.1440 * Ebatt + 2.96
3	Low-Energy, Medium-Voltage		4-10 V	For Ebatt <10Wh, UEC = 1.42 kWh/yr Ebatt ≥10 Wh, UEC = 0.0255 * Ebatt + 1.16
4	Low-Energy, High-Voltage		>10 V	0.11 * Ebatt + 3.18
5	Medium-Energy, Low-Voltage	100-3000 Wh	<20 V	0.0257 * Ebatt + .815
6	Medium-Energy, High-Voltage		≥20 V	0.0778 * Ebatt + 2.4
7	High-Energy	>3000 Wh		0.0502 * Ebatt + 4.53

Standards for Small Battery Charger Systems

<u>Performance Parameter</u>	<u>Standard</u>
Maximum 24 hour charge and maintenance energy (Wh) (E_b = capacity of all batteries in ports and N = number of charger ports)	For E_b of 2.5 Wh or less: $16 \times N$ For E_b greater than 2.5 Wh and less than or equal to 100Wh: $12 \times N + 1.6 E_b$ For E_b greater than 100 Wh and less than or equal to 1000Wh: $22 \times N + 1.5 E_b$ For E_b greater than 1000 Wh: $36.4 \times N + 1.486 E_b$
Maintenance Mode Power and No Battery Mode Power(W) (E_b = capacity of all batteries in ports and N = number of charger ports)	The sum of maintenance mode power and no battery mode power must be less than or equal to: $1 \times N + 0.0021 \times E_b$

Department of Energy (CEC) sampling plan for Battery chargers

Determination of represented value. Manufacturers must determine represented values, which include certified ratings, for each basic model of battery charger in accordance with the following sampling provisions.

Represented values include: The unit energy consumption (UEC) in kilowatt-hours per year (kWh/yr), battery discharge energy (E_{batt}) in watt hours (Wh), 24-hour energy consumption (E₂₄) in watt hours (Wh), maintenance mode power (P_m) in watts (W), standby mode power (P_{sb}) in watts (W), off mode power (P_{off}) in watts (W), and duration of the charge and maintenance mode test (t_{cd}) in hours (hrs) for all battery chargers other than uninterruptible power supplies (UPSs); and average load adjusted efficiency (Eff_{avg}) for UPSs.

Test Result:

sample No	Input (V)	(Hz)	E24 (Wh)	Pm (W)	Ebat (Wh)	tcd (h)	Psb (W)	Poff (h)	UEC calculated (kWh/yr)	Max.UEC (kWh/yr)
1#	115	60	117.2	0	79.84	24.6	0.050	--	6.668	11.962
2#	115	60	117.6	0	78.97	24.6	0.050	--	6.895	
average	--	--	117.4	0	79.405	/	0.050	--	6.7815	

Note: The appliance complies with the requirements of CEC Appliance Efficiency for Federally Regulated Battery Chargers

Product photos of EUT:

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Attachment B — Equipment List

Ref.	Equip. name	supplier	type	last cal.	due to
DZ-SY-113-03	Battery Test system	Rui Neng	BTS-60V40A	2023.04.27	2024.04.26
DZ-SY-220	Power meter	EVERFINE	PF310A	2023.04.27	2024.04.26
DZ-SY-004	Variable frequency power supply	Shenzhen Hengxinlong Technology Co., Ltd	HXL-3130	2023.04.27	2024.04.26

*****END OF REPORT*****