



Certificate of Compliance

Certificate: 80082107

Master Contract: 301721

Project: 80082107

Date Issued: 2021-09-01

Issued to: Zhongrui Green Energy Technology (Shenzhen)Co.,Ltd
Room 2304-2
Block B, Zhihuijiayuan
76 Baohe Avenue
Baolong Street
Shenzhen, Guangdong 518116
China

Attention: Mr. Jason Wang

The products listed below are eligible to bear the CSA Mark shown with adjacent indicator 'US' for US only



Issued by: Ciggle Pei

PRODUCTS

CLASS C370182 - Battery System for use in Stationary Applications - Certified to US Standards

Battery Pack System for use in Stationary Electrical Energy Storage Application, Lithium-ion, Power Base Mate LV Series, the detailed Model name and Electrical Ratings are noted as below:



Certificate: 80082107
Project: 80082107

Master Contract: 301721
Date Issued: 2021-09-01

Electrical Ratings:

Battery System Model	Battery System Ratings				Battery Module	Master control Model
	Normal Voltage Vdc	Normal Capacity Ah/kWh	Battery Module Configuration	Enclosure IP Rating		
ZR-PBML-40S	51.2	800Ah/ 40.96kWh	8P1S	IP55	ZR-FS48100- 16OSJ1	ZR-MC100- 200M2
ZR-PBML-35S		700Ah/ 35.84kWh	7P1S			
ZR-PBML-30S		600Ah/ 30.72kWh	6P1S			
ZR-PBML-25S		500Ah/ 25.6kWh	5P1S			
ZR-PBML-20S		400Ah/ 20.48kWh	4P1S			
ZR-PBML-15S		300Ah/ 15.36kWh	3P1S			
ZR-PBML-10S		200Ah/ 10.24kWh	2P1S			
ZR-PBML-5S		100Ah/ 5.12kWh	1P1S			
ZR-PBML-40SE	48	800Ah/ 38.4kWh	8P1S		ZR-FS48100- 15OSJ1	
ZR-PBML-35SE		700Ah/ 33.6kWh	7P1S			
ZR-PBML-30SE		600Ah/ 28.8kWh	6P1S			
ZR-PBML-25SE		500Ah/ 24kWh	5P1S			
ZR-PBML-20SE		400Ah/ 19.2kWh	4P1S			
ZR-PBML-15SE		300Ah/ 14.4kWh	3P1S			
ZR-PBML-10SE		200Ah/ 9.6kWh	2P1S			
ZR-PBML-5SE		100Ah/ 4.8kWh	1P1S			



Certificate: 80082107
Project: 80082107

Master Contract: 301721
Date Issued: 2021-09-01

Note*: Battery system ZR-PBML-x series consists of 1-8 modules ZR-FS48100-16OSJ1, which are in parallel connected with Master control Model ZR-MC100-200M2. Where x=5~40
 Battery system ZR-PBML-xE series consists of 1-8 modules ZR-FS48100-15OSJ1, which are in parallel connected with Master control Model ZR-MC100-200M2. Where x=5~40
 Module ZR-FS48100-16OSJ1 consists of 16pcs cells connected in series configuration.
 Module ZR-FS48100-15OSJ1 consists of 15pcs cells connected in series configuration.

Manufacturer's Specified Charging Parameters for Battery System

Battery System Model	Temperature Range, °C	Normal Charging Voltage, Vdc	Normal Charging Current, A	Maximum Charging Voltage, Vdc	Maximum Charging Current, A
ZR-PBML-40S ZR-PBML-35S ZR-PBML-30S	0-50	56.8	0.2C	56.88	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-25S ZR-PBML-20S ZR-PBML-15S ZR-PBML-10S ZR-PBML-5S	0-50	56.8	0.2C	56.88	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-40SE ZR-PBML-35SE ZR-PBML-30SE	0-50	53.25	0.2C	53.32	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-25SE ZR-PBML-20SE ZR-PBML-15SE ZR-PBML-10SE ZR-PBML-5SE	0-50	53.25	0.2C	53.32	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C



Certificate: 80082107
Project: 80082107

Master Contract: 301721
Date Issued: 2021-09-01

Manufacturer's Specified Discharging Parameters for Battery Pack:

Battery System Model	Temperature Range, °C	Normal Discharging Current, A	End-of-discharge voltage, Vdc	Maximum Discharging Current, A
ZR-PBML-40S ZR-PBML-35S ZR-PBML-30S	-15-50	0.2C	46.88	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-25S ZR-PBML-20S ZR-PBML-15S ZR-PBML-10S ZR-PBML-5S	-15-50	0.2C	46.88	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-40SE ZR-PBML-35SE ZR-PBML-30SE	-15-50	0.2C	43.95	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C
ZR-PBML-25SE ZR-PBML-20SE ZR-PBML-15SE ZR-PBML-10SE ZR-PBML-5SE	-15-50	0.2C	43.95	0°C~15°C@0.2C 15°C~35°C@1C 35°C~50°C@0.2C

APPLICABLE REQUIREMENTS

ANSI/CAN/UL-1973:2018, Second Edition - Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications.



Certificate: 80082107
Project: 80082107

Master Contract: 301721
Date Issued: 2021-09-01

Conditions of Acceptability:

1. The battery pack including its battery management system has been tested according to the functional-safety requirements of ANSI/CAN/UL-1973:2018, Second Edition. Solid state circuits and software controls relied upon as the primary safety protection, have been evaluated to the Standard for Safety: Automatic Electrical Controls – Part 1, CSA/UL 60730-1. Any change to the software and electronic controls of the BMS may require additional testing.
2. The enclosure was evaluated to establish an IP rating of IP55 with the Standard for Degrees of Protection Provided by Enclosure (IP Code) IEC 60529.
3. Product is evaluated for indoor use and shall avoid being used in moisture environment, and not being used near marine environments.
4. Further evaluation for Resistance of Moisture and/or Salt Fog shall be required for the battery pack intended to be used in the end product where moisture and/or salt fog condition were applied.
5. Manual disconnect device shall be required during the installation of the end products.
6. Corrosion due to electrochemical action is to be determined for conductive parts in contact with terminals when subjecting to the installation of the end products.
7. Equipment Application Location: Stationary
8. Access Location: Operator Accessible.
9. The installation was not evaluated. The battery system shall be installed in accordance with NFPA 70 or other applicable installation code.
10. Dielectric Voltage Withstand Test was performed with the test potential of 1000Vac/1414 Vdc, a higher test potential shall be considered in the end product if higher overvoltage category specified.
11. Overvoltage Category(OVC): 2
12. Pollution Degree(PD): 2
13. Altitude for Operation: Up to 2000 m.

Certificate: 80082107
Project: 80082107

Master Contract: 301721
Date Issued: 2021-09-01

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

The markings shall be legibly and permanently marked with:

- a) The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US, or with adjacent indicator 'US' for US only, or without either indicator for Canada only:



- b) Batteries shall be marked with the manufacturer's name, trade name, trademark, CSA master contract number "301721" or other descriptive marking which may identify the organization responsible for the product.
- c) Part number or Model number; as specified in product section above.
- d) Electrical ratings in volts dc and capacity in Ampere-hours or Watt-hours and chemistry; as specified in product section above.
- e) The electric energy storage system terminals shall be marked to indicate whether they are positive (+) or negative (-).
- f) Battery system shall be marked with the maximum short circuit current and duration (at maximum short circuit current) at the system output terminals (No less than 3100A/12ms)
- g) Electric energy storage systems shall also be marked with the date of manufacture, which may be in the form of a code that does not repeat within 20 years.
- h) Systems shall be marked with a cautionary marking indicating to read all instructions before installation, operation and maintenance of the system. This marking may be in the form of the symbol(s) for example: the Standard for Graphical Symbols for Use on Equipment – Index and Synopsis, ISO 7000, "caution" Symbol No. 434 (exclamation point inside triangle) followed by the "read instruction manual" Symbol No. 790 (open book). If using symbols, their meaning shall be explained in the instruction manual.
- i) The main ground terminal of the protective grounding system shall be identified by one of the following:
- a) A green-colored, not readily removable terminal screw with a hexagonal head;
 - b) A green-colored, hexagonal, not readily removable terminal nut;
 - c) A green colored pressure wire connector; or
 - d) The word "Ground" or the letters "G" or "GR" or the grounding symbol (IEC 60417, No. 5019) or otherwise identified by a distinctive green color.



Supplement to Certificate of Compliance

Certificate: 80082107

Master Contract: 301721

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
80082107	2021-09-01	Original Certification for Battery Pack System for use in Stationary Electrical Energy Storage Application, Lithium-ion, Power Base Mate LV Series, Model ZR-PBML-40S, ZR-PBML-35S, ZR-PBML-30S, ZR-PBML-25S, ZR-PBML-20S, ZR-PBML-15S, ZR-PBML-10S, ZR-PBML-5S, ZR-PBML-40SE, ZR-PBML-35SE, ZR-PBML-30SE, ZR-PBML-25SE, ZR-PBML-20SE, ZR-PBML-15SE, ZR-PBML-10SE, ZR-PBML-5SE by ANSI/CAN/UL-1973:2018, Second Edition.