SUNWODA ENERGY

Specifications
Oasis L215

Battery Cabinet

Preface

Thanks for purchasing this product manufactured by Shenzhen Sunwoda Energy Technology Co., Ltd.(hereinafter referred to as Sunwoda).

This manual will provide detailed instructions about Oasis L215, which copyright belongs to Sunwoda, copy rights not expressly granted are not reserved.

The contents of this document may be updated from time to time due to product version upgrades or other reasons. Unless otherwise agreed, this document is intended as a product instruction only. We sincerely hope that our products and manuals will meet your needs.We welcome your valuable comments and will continue to improve and enhance them.

All statements, information and recommendations contained in this document do not constitute any warranty, express or implied. Contents in this manual are subject to change without any prior notice, please always subject to the latest physical. If any question you have, feel free to contact Sunwoda.

Content

1. Brief Description

1.1 Basic introduction

Based on Sunwoda's mature experience in management of Li-ion battery system, Oasis L215 adopts long-life Li-FePO4 batteries with excellent performance, and possesses the proven passive equalization management system, highly-developed and optimized data monitoring and storage technology, and security control technology of electric power system, which is technologically advanced, reliable, with excellent performance, and can satisfy power supply needs of high-power power-using scenarios.

1.2 Application scenarios

Mainly used in industrial parks, financial institutions, educational institutions, buildings, gas stations, residential communities and other small and medium-sized industrial and commercial energy storage scenarios. With different power segments of the PCS,this product can be used to realize peak shaving and valley filling, emergency power backup, peak frequency regulation and other functions.

2. Product Overview

2.1 Specification overview

This product adopts integrated cabinet design, consisting of liquid-cooled PACK, BMS, fire-fighting and temperature-humidity control system, liquid-cooled unit and other power distribution devices. The rated capacity of the system is 215kWh, the rated capacity of the PACK is 43kWh (1P48S), adopting 280Ah battery cell, supporting 5 PACKs connected in series, expanding the capacity through parallel way, and matching with the convergence cabinet to realize battery cabinet paralleling in six.

Battery management system consists of PACK-level BMM, cluster-level BCM and stack-level ESMU (optional). It has the functions of data information reporting, electrical equipment communication, battery status management, operation status self-check, etc. The BMM has high detection accuracy, small data error, flexible alarm response, three-level system protection capability, and supports information interaction with the superior management system.

The system has a built-in aerosol fire-fighting component. Once its temperature sensor detects a temperature is higher than 80℃, it will trigger the fire-fighting program and release the aerosol to extinguish the fire. The temperature control unit in system adopts air-cooled water chiller, which can effectively control temperature difference of the battery cell within 3~5℃.

Figure 2.1.1 Schematic diagram of product effect

2.2 Technical parameters

Rated capacity	215kWh
Rated charge/discharge power	100kW(0.5CP)
Maximum charge/discharge power	215kW(1CP)
Voltage range	672V~864V
Operating ambient temperature	-30℃～55℃
Storage ambient temperature	-30℃～60℃
Operating relative humidity	5～95%
Storage relative humidity	5～95%
Altitude	≤2000m
Protection grade	IP55
Pollution grade	III
Anti-corrosion grade	C4
Size W *D* H	1570*1350*2380mm
Dimensions	2655±100kg
Communication protocol	CAN/Modbus TCP
Transportation Requirements	Sea/Land transportation
Wiring type	Quick-plug terminals

3. Product specifications

3.1 Battery cell

The battery cell is square aluminum shell of LFP, with specifications of 3.2V,280Ah. The case of the battery cell has enough rigidity and strength to protect the inner part from damage due to mechanical collision or man-made abuse, and to improve the safety of the product. The battery cells are equipped with explosion relief valves for pressure release to ensure that the system can release the internal pressure when overcharging, over-discharging, short-circuiting or thermal runaway, avoiding the explosion of the battery cells and preventing serious harm to people or property.

Figure 3.1.1 Schematic of 3.2V/280Ah LFP cell

Cell parameters

Cell Type	LFP（LiFePO4）
Rated Capacity	280Ah
Rated Voltage	3.2V
Rated Energy	896Wh
Operating Voltage Range	2.5~3.65V
Rated charge/discharge rate	0.5C
Maximum Continuous Charge/Discharge Rate	1C
Storage temperature	-30℃～60℃
Charging temperature	0℃～60℃
Discharge temperature	-30℃～60℃
Dimension (W*D*H)	174mm*72mm*207mm
Weight	5.4kg
Energy Density	166Wh/kg
Calendar Life	≥ 8000times (25℃，0.5CP，70%DOD)

3.2 PACK (Battery module)

The battery module has the following characteristics:

（1）Modularized design, quick installation and maintenance.

（2）Positive and negative output terminals are clearly marked for easy connection, inspection and maintenance.

（3）Welding method: laser welding technology, low impedance, high strength, to ensure the reliability of the connection.

（4）BMS adopts passive equalization method, which is economical and has mature market application experience.

（5）Safety design: space is reserved above the cell's pressure relief valve to prevent excessive pressure explosion in abnormal case.

（6）Heat dissipation design: Liquid cooling is adopted to dissipate heat, and the liquid cooling plate is integrated in the battery box to ensure the fastest transfer of heat from the battery cells.

Battery PACK parameters

Model	B1F-154/43-CN
Specification	153.6V, 280Ah
Combination	1P48S
Rated voltage	153.6V
Rated energy	43.008kWh
Rated charge/discharge current	140A
Maximum charge/discharge current	280A
Voltage range	134.4~172.8V
Storage temperature range (℃)	-30℃~60℃
Charge temperature range (℃)	0℃~60℃
Discharge temperature range (℃)	-30℃~60℃
Cooling mode	liquid cooling
Structure Dimension (W*D*H)	1036*876*258mm
Weight	326±5kg

3.3 Battery cluster

One set of battery cluster of this product consists of 5 PACKs totaling 215kWh.

The battery cluster has the following characteristics:

(1) Single cluster adopts series connection design, which supports high voltage output without loop current problem.

(2) The cabinet adopts a frame structure, and the battery packs are connected to each other by the high-voltage power harness and low-voltage communication harness, meeting the electrical isolation requirements.

(3) The structure is safe and reliable, and the mechanical strength is sufficient to ensure that there is no shaking or deformation after the installation of the equipment.

(4) The design gives full consideration to the electrical clearance and creepage distance. During the design, the system working voltage, over-voltage category, pollution level and insulation materials are fully considered.

Cluster parameters

Composition	5 modules in series
Series connection	1P240S
Rated charge/discharge rate	0.5C
Maximum continuous charge/discharge rate	1C
Rated energy	215.04 kWh
Rated voltage	768V
Operating voltage range	672~864V
Communication mode	CAN, Modbus
Equalization type	Passive equalization

3.4 Battery management system (BMS)

The product employs a two-tier structure, which consists of a Battery Management Unit (BMM) and a Battery Cluster Management Unit (BCM) down to the top, each battery box is equipped with two sets of BMMs, each of which is responsible for collecting the voltage and temperature of single cell and has equalization function.

The BMMs communicate with the BCM using CAN bus, and the BCM collects the BMM data

in polling mode. Each battery cluster is equipped with 1 set of BCM, which is installed in the high-voltage control box. The data detected by the BMM is summarized through the CAN protocol, and after analyzing the total voltage and current, the battery cluster's BCM also interacts with the higher-level equipment based on CAN communication.

Battery management system can realize the functions of battery status monitoring, operation status control, insulation monitoring, equalization management, protection alarm and communication, etc. By real-time supervision of battery system, it ensures the normal, stable and safe operation of the system. Battery management system includes:

Primary management (BMM): with the function of monitoring the voltage and temperature of single cell.BMM is the smallest management unit of the BMS and provides internal information of the battery module to BCM through communication interface.

Secondary management (BCM): It is a real-time monitoring and management system composed of electronic circuit equipment, which can effectively manage the battery charging and discharging process in a safe manner, and provide alarm and emergency protection against possible failures, so as to ensure the safe, reliable and stable operation of the battery.

3.5 Control box

The control box is the power control unit of the battery cluster, integrating components such as BCM, relays, contactors, fuses, halls and circuit breakers. It is an indispensable part to realize the function of battery cluster by providing on-off protection and control.

Control box parameters

Rated Voltage	1500Vdc
Maximum current	400A
Communication Interface	CAN/Modbus
Communication protocol	CAN/Modbus TCP
Dimension (W*D*H)	600*700*200mm
Weight	33±3kg

3.6 Fire protection system

3.6.1 Temperature & Smoke sensor

With built-in temperature sensor and smoke sensor, when the detected temperature and smoke

reach a certain threshold synchronously, trigger the system alarm.

3.6.2 Gas detector & Exhaust fan

With built-in gas detector, when detecting the concentration of H2 reaches 25%LeL, the exhaust fan starts; when the concentration of H2 rises further to 50%LeL, the exhaust fan shuts down and starts the next fire fighting program.

3.6.3 Aerosol fire fighting

When the aerosol temperature detector detects the temperature is higher than 80℃, it will trigger the startup program to release the aerosol.

3.6.4 Explosion relief plate & Fire hydrant

In order to ensure the reliability of fire protection, our company is equipped with two fire fighting channels, namely, explosion venting plate and fire hydrant. When an explosion occurs due to overcharging, over-discharging, short-circuit, thermal runaway, etc., the top explosion venting plate can respond at the first time to balance the pressure inside the battery cabinet to avoid an explosion; when the fire is controllable, cold water can be injected into the hydrant through the cabinet door to control the system temperature as soon as possible.

3.7 Temperature control system

The temperature control system consists of liquid cooling machine, water-cooled pipeline, liquid cooling plate, etc. The liquid cooling plate is integrated inside the battery box. The temperature control system starts and stops are managed by the parameters set on the BMS, which turns on the functions of cooling and heating according to the temperature of battery cell it collects and the temperature control mode it sets. Default 28℃ cooling on, 22℃ cooling off; 10℃ heating on, 15℃ heating off.

3.8 Outdoor cabinet

3.8.1 Basic overview

Integrating the battery cluster, water-cooling unit, fire protection and other equipments into the battery cabinet, it has independent self-power supply system, temperature control system, fire protection system and other automatic control and safety protection devices to ensure that the system

is always in a good temperature and optimal operating performance. The three-level fire protection strategy ensures that the system can operate stably even under extreme conditions.

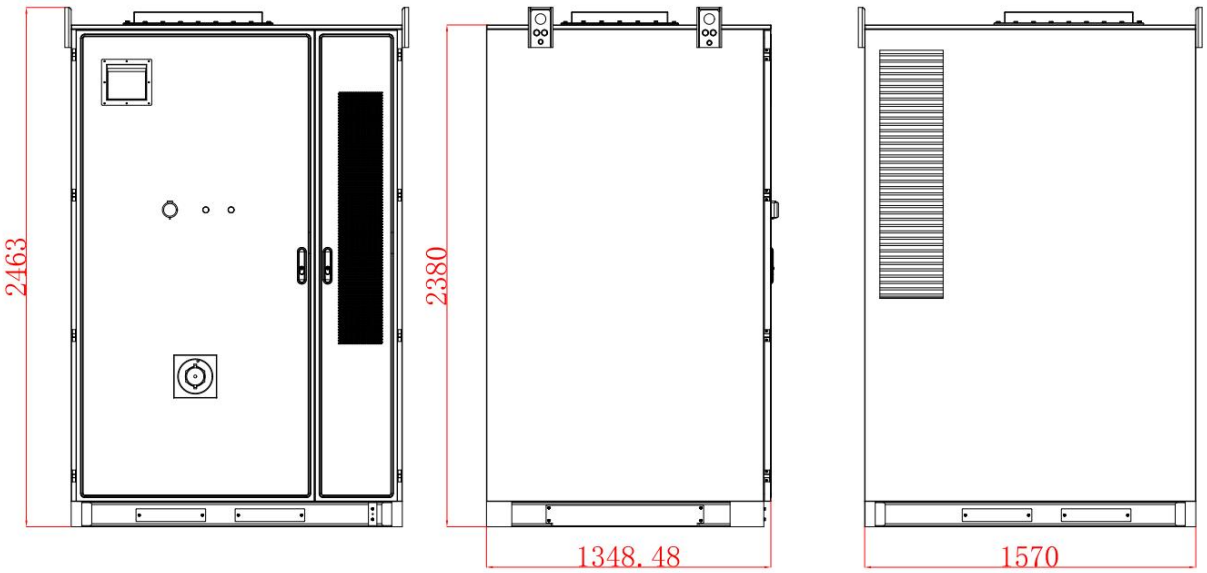
3.8.2 Cabinet features

In order to ensure sufficient strength and 10 years design life requirements, outdoor cabinet SPCC plate thick 1.5mm, zinc-rich bottom powder coating and outdoor powder coating double layer design makes the shell with good anti-corrosion, weathering performance.Outdoor cabinet shell tape in the range of 200 ℃ will not produce residual glue.

Outdoor cabinet has excellent fireproof performance, cabinet protection grade IP55, with the ability to prevent sand, water, moisture, salt spray, etc.; anti-vibration performance meets the requirements of transportation standards.

It has good insulation performance of power and non-main power cables inside the cabinet, and the flame-retardant performance are favorable.

3.8.3 Dimensional drawing



Shenzhen Sunwoda Energy Technology Co., Ltd.

Sunwoda Industrial Park, No.18 Tangjia South Road, Guangming New District,Shenzhen, China
www.sunwodaenergy.com