Every system is equiped only one high voltage box for managing high voltage circuit and carry second level BMS

SOLE 15000 Battery pack

51.2 V / 280 AH / 14.33 KWH

High voltage box with BMS

Max voltage : 1500 V Max current: 250A

FFD Power Tec Co., LTD

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Ang Li

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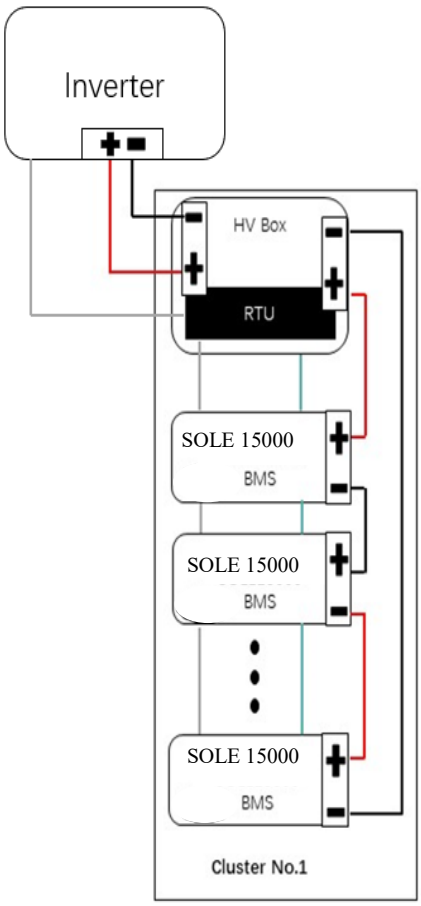
SOLE 15000-XS

High voltage energy storage system

The SOLE 15000-XS is a high-voltage energy storage system comprising multiple LFP battery modules, specifically the SOLE 15000 model, each with a capacity of 51.2Vdc/280 AH. This system includes a high-voltage enclosure designed for energy storage and distribution, supplying power to inverters, PCS units, chargers, and dischargers.

- SOLE 15000-4S: 57.32KWH ; 204. 8V 280AH
- SOLE 15000-5S: 71.65KWH ; 256V 280AH
- SOLE 15000-6S: 85.98KWH ; 307.2V 280AH
- SOLE 15000-7S: 100.13KWH ; 358.4V 280AH
- SOLE 15000-8S: 114.64KWH ; 409.6V 280AH
- SOLE 15000-9S: 128.97KWH ; 460.8V 280AH
- SOLE 15000-10S: 143.3KWH ; 512V 280AH
- SOLE 15000-11S: 157.63KWH ; 563.2V 280AH
- SOLE 15000-12S: 171.96KWH ; 614.4V 280AH
- SOLE 15000-13S: 186.29KWH ; 665.6V 280AH



- SOLE 15000-20S: 286.6KWH ; 1024V 280AH
- SOLE 15000-21S: 300.93KWH ; 1075.2V 280AH
- SOLE 15000-22S: 315.26KWH ; 1126.4V 280AH
- SOLE 15000-23S: 329.59KWH ; 1177.6V 280AH
- SOLE 15000-24S: 343.92KWH ; 1228.8V 280AH

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FFD POWER

Ref. Certif. No.
NL-90990

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Lithium Battery Energy Storage
Name and address of the applicant	SHENZHEN FFD POWER TEC CO., LTD ROOM 308, XINTIAN STREET 70, XINTIAN DISTRICT, FUHAI, BAOAN, SHENZHEN, GUANGDONG, China
Name and address of the manufacturer	DONGUAN FASFREDE TECHNOLOGY CO., LTD. ROOM 302, BUILDING NO.1, SANZHUANG SUD STREET NO.6, HOUJIE DISTRICT, DONGGUAN CITY, GUANGDONG PROVINCE, China
Name and address of the factory *Note: When more than one factory, please report on page 2*	DONGUAN FASFREDE TECHNOLOGY CO., LTD. ROOM 302, BUILDING NO.1, SANZHUANG SUD STREET NO.6, HOUJIE DISTRICT, DONGGUAN CITY, GUANGDONG PROVINCE, China ☐ Additional information on page 2
Ratings and principal characteristics	SOLE 15000-1S: 51,2 Vdc, 280 Ah, 14,33 KWh; SOLE 15000-2S: 102,4 Vdc, 280 Ah, 28,67 KWh; SOLE 15000-3S: 153,6 Vdc, 280 Ah, 43,008 KWh; SOLE 15000-4S: 204,8 Vdc, 280 Ah, 57,344 KWh; SOLE 15000-5S: 256,0 Vdc, 280 Ah, 71,68 KWh; SOLE 15000-6S: 307,2 Vdc, 280 Ah, 86,016 KWh; SOLE 15000-7S: 358,4 Vdc, 280 Ah, 100,352 KWh; SOLE 15000-8S: 409,6 Vdc, 280 Ah, 114,688 KWh; SOLE 15000-9S: 460,8 Vdc, 280 Ah, 129,024 KWh; SOLE 15000-10S: 512,0 Vdc, 280 Ah, 143,36 KWh; SOLE 15000-11S: 563,2 Vdc, 280 Ah, 157,696 KWh; SOLE 15000-12S: 614,4 Vdc, 280 Ah, 172,032 KWh; SOLE 15000-13S: 665,6 Vdc, 280 Ah, 186,368 KWh; SOLE 15000-14S: 716,8 Vdc, 280 Ah, 200,704 KWh; SOLE 15000-15S: 768,0 Vdc, 280 Ah, 215,04 KWh; SOLE 15000-16S: 819,2 Vdc, 280 Ah, 229,376 KWh; SOLE 15000-17S: 870,4 Vdc, 280 Ah, 243,712 KWh; SOLE 15000-18S: 921,6 Vdc, 280 Ah, 258,048 KWh; SOLE 15000-19S: 972,8 Vdc, 280 Ah, 272,384 KWh; SOLE 15000-20S: 1024,0 Vdc, 280 Ah, 286,72 KWh; SOLE 15000-21S: 1075,2 Vdc, 280 Ah, 301,056 KWh; SOLE 15000-22S: 1126,4 Vdc, 280 Ah, 315,392 KWh; SOLE 15000-23S: 1177,6 Vdc, 280 Ah, 329,728 KWh; SOLE 15000-24S: 1228,8 Vdc, 280 Ah, 344,064 KWh; SOLE 15000-25S: 1280,0 Vdc, 280 Ah, 358,40 KWh.
Trademark / Brand (if any)	FFD POWER
Customer's Testing Facility (CTF) Stage used	
Model / Type Ref.	SOLE 15000-1S, SOLE 15000-2S, SOLE 15000-3S, SOLE 15000-4S, SOLE 15000-5S, SOLE 15000-6S, SOLE 15000-7S, SOLE 15000-8S, SOLE 15000-9S, SOLE 15000-10S, SOLE 15000-11S, SOLE 15000-12S, SOLE 15000-13S, SOLE 15000-14S, SOLE 15000-15S, SOLE 15000-16S, SOLE 15000-17S, SOLE 15000-18S, SOLE 15000-19S, SOLE 15000-20S, SOLE 15000-21S, SOLE 15000-22S, SOLE 15000-23S, SOLE 15000-24S, SOLE 15000-25S
Additional information (if necessary may also be reported on page 2)	☐ Additional information on page 2
A sample of the product was tested and found to be in conformity with	IEC 62619:2022
As shown in the Test Report Ref. No. which forms part of this Certificate	4903105.50

This CB Test Certificate is issued by the National Certification Body

DEKRA Certification B.V.
Meander 1051
Arnhem, 6825 MJ
Netherlands

DEKRA

Date: 2023-09-05

Signature: Miranda Zhou

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SOLE 15000

High voltage energy storage system module

The high voltage energy storage system module is a reliable and efficient solution designed to meet the energy storage needs of industrial and commercial applications. With a basic parameter of 51.2V/ 280AH, this module is equipped with cutting-edge EVE cell technology, renowned for its high energy density, long cycle life, and exceptional safety features.

Together with our management system , Sole 15000 can be easily connected with other modules, enabling it to provide energy storage capacity of from 43 KWH to 344KWH, making it an ideal solution for large-scale energy storage

Product features

- **High Reliability :** 6500 cycles guaranteed
- **Connection mode :** In series
- **Cell :** A grade EVE 280AH * 16 Series
- **Monitor :** 8 temperature sensor , 16 voltage sensor
- **Easy connection:** Automatic ID generating
- **Equalizing system :** Passive standard (Active optional)
- **Pack and Cell detection** : Voltage , current , temperature, short circuite , isolation alarm , protection

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Technical data

Model	**SOLE 15000**
Battery Module	1
Battery Type	Lithium-Iron-Phosphate (LiFePo4)
Usable Storage Capacity	14.3 kWh
Nominal Voltage	51,2 VDC
Standard Charge Current	140A
Standard Discharge Current	140A
Dimensions [L.W.H mm]	700 x 480x 230
Weight	115 kg
Ambient Temperature	Charge: 0°C--55°C Discharge: -20°C--55°C
Cycles	>= 6000 cycles @ 80% DoD
Communication Interface	CAN
Approvals and Standards	IEC62619 / UN38.3 / CE-EMC
Warranty	7 years
Possible Applications	OFF-Grid + Hybrid

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HV BOX

SOLE 15000 Cluster management system

HV Box - the ultimate solution for managing high voltage clusters with ease and safety! Specifically designed for the Sole 15000 lithium battery high voltage cluster, this multi-functional electrical box is built with the latest technology to ensure reliable performance and electrical safety.

With an electrical level of 1500 V/250A , the HV Box includes advanced features such as battery cluster voltage and current acquisition, switch control (general positive, general negative, pre-charge, and disconnector), fan driver, BMS power supply, and communication with BMS and SCU. The HV Box is the perfect solution for labs, industrial applications who require a reliable and easy-to-use high voltage energy storage system with a capacity of up to 344KW.H.

In large-scale energy storage systems with multiple clusters, the HV Box serves as the necessary execution unit of the single cluster under the control of SCU. Whether you're managing a small or large-scale energy storage system, the HV Box delivers optimal performance, reliability, and safety.

Function features

- Cluster detection : Cluster voltage and current
- Power supply : BMS , Fan DC power supply
- Switch checking : General positive , general negative , pre-charge , fan switch status checking
- Cluster shut-down : Disconnector to shut down cluster for emergency and maintenance
- Charge and discharge management : By communication with BMS on Sole 15000 , manage charge and discharge logic and protection

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Technical data

Model	HVB1500V
Working temperature	-20℃-+65℃
Storage temperature	-40℃-+125℃
Working humidity	5-95% RH
Working altitude	0-4000 m
Max Voltage	1500Vdc
Max Current	250A
Power supply	220Vac
Fan in	220Vac
Fan out	0~24Vdc
Max capacity	SOLE 15000*20 Units @ 286Kwh
Pre-charge	5Ω/200W
Voltage aquisition	0~1500Vdc Cluster voltage <=1000V (≤±1% FS)
Current aquisition	0~250A (FS±1% FS)
CAN 1	Communication with BMS
CAN 2	Communication with SCU or inverter
RS 485	Communication with inverter

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Busbar Cabinet

Multi cluster management system

The Busbar Cabinet is an essential component of any energy storage system, providing efficient and reliable control, protection, and communication capabilities.

It is a control cabinet that connects battery clusters with PCS energy storage inverters, EMS systems, and environmental monitoring equipment (such as fire, air conditioning, and access control systems). Inside the cabinet, you will find the large storage system battery pack circuit breaker (with live operation), UPS power supply, large storage master control and monitor module, large storage display , and an emergency stop switch. These components work together to enable the control, protection, and data communication functions of the lithium-ion energy storage battery pack's charging, discharging, and operations.

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Technical data

Model	Busbar box-1500A
Electrical Level	1500V/1500A
Working Temperature	-15℃-+40℃
Storage Temperature	-40℃-+125℃
Working Humidity	5-95% RH
Working Altitude	0-4000 m
Max Voltage	1500V
Max Current	1500A
Power Supply	220Vac
UPS	220Vac
Control and Display	Touch screen
Max Capacity	10 Clusters @2.86MWH
CAN	3 Ports : Communication with RTU
LAN	3 Ports :Communication with Inverter and display
RS 485	4 Ports
RS 232	1 Port Communication with UPS

Function features

- **Power supply :** Power SCU and display with DC , Power HV box with 220VAC
- **UPS :** Power 220AC to UPS with battery to keep the system Uninterruptedly powered
- **Communication :** Communication with HV box , Inverter , EMS and environmental monitor
- **Emergency stop :** Stop system for emergency
- **Data storage and export :** Operation , allarm and protection data storage
- **Monitor :** Parameters detected on HV box and Sole 15000

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Energy storage management system for industrial use

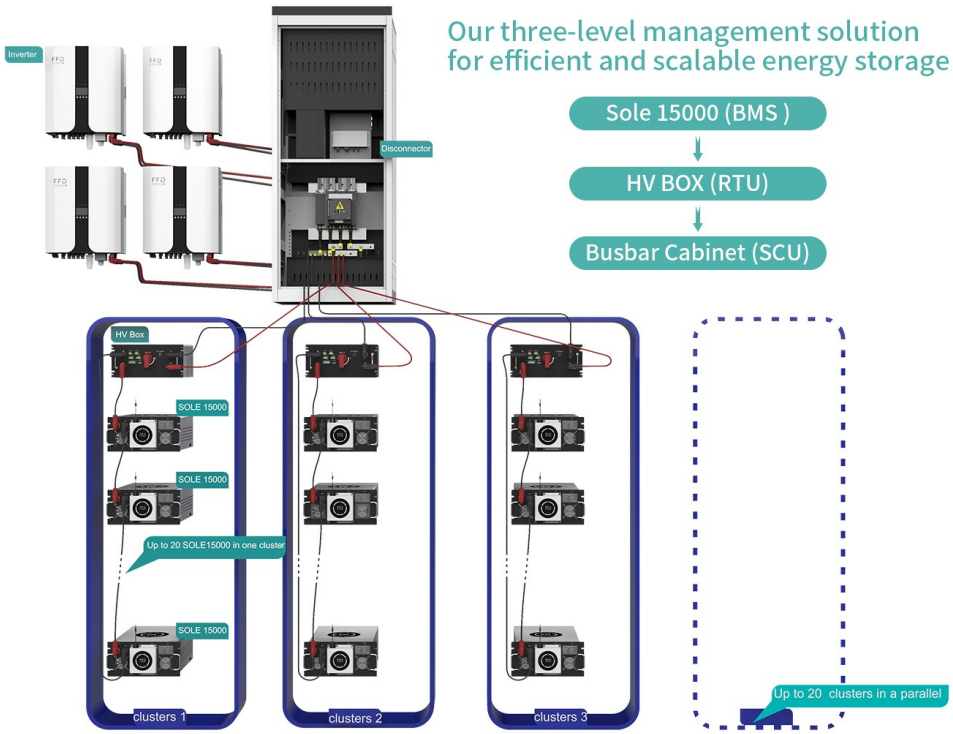
Cluster 1228.8V @ 3439.2KWH

Our three-level management solution for efficient and scalable energy storage is based on a Battery Management System (BMS), Remote Terminal Unit (RTU), and System control unit (SCU).

At the core of the system, the BMS provides essential cell control, monitoring, and protection for reliable and safe operation of Sole 15000 units with 14.33 KWH energy storage capacity.

The second level of the system features an RTU, integrated into the high voltage box, for cluster management of up to 24 units of Sole 15000 with 343.9KWH energy storage capacity. This enables easy monitoring and control of multiple energy storage clusters.

For large-scale energy storage, our system offers a third level of management, featuring a comprehensive SCU integrated into the busbar box. This system can efficiently manage up to 10 battery clusters in parallel, with a total energy storage capacity of 3439.2KWH. By optimizing energy usage and reducing energy costs, our system is ideal for commercial and industrial applications.



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