

Dawnice ESS SOLUTION

Yichun Dawnice Manufacture & Trade Co., Ltd.



A modern, multi-story office building with a glass facade and a dark top section. The building is set against a clear blue sky. In the foreground, there are green trees and a street lamp. The word "Dawnice" is visible on the top left of the building.

Chapter

01

Company Profile

To be a World-Class Energy Services Provider

20+ years

experience in Electric Power System industry

BUSINESS SCOPE

Smart Meter

Energy Storage System

EV Charger

\$516 million

In 2020 revenues

3000+

Employees

Started to research and develop battery energy storage system. It was the earliest enterprise in China to research ESS technology and the sole chairman of the China Energy Storage Association.



Built Biggest Energy trading ESS station in Texas US(90MW/100MWh)

2009

2018

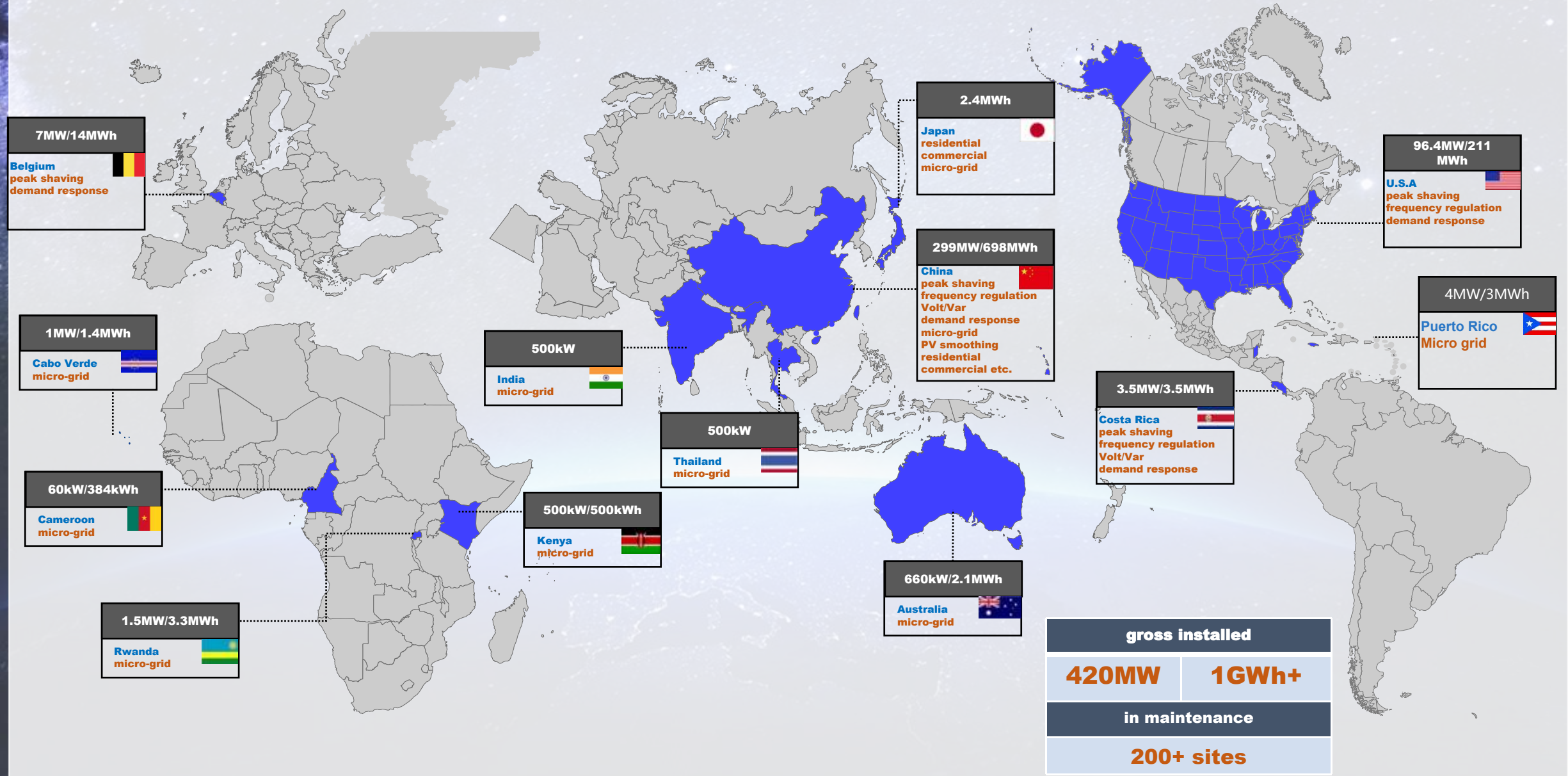
2020



*Built and operated Biggest FR ESS plant in China(30MW/15MWh)
C&I project over 100MWh*



Battery storage project in worldwide

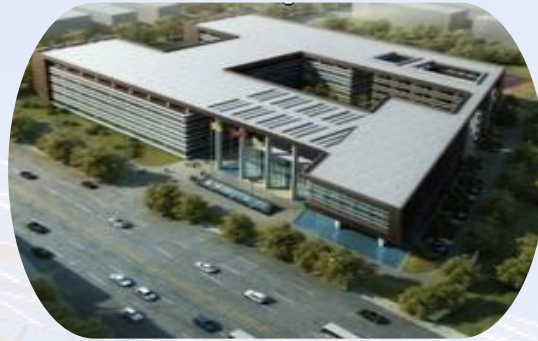


Manufacture overview for ESS



SZ Headquarters

ESS R&D teams, sales teams, supply chain teams, Financial teams and HR teams



Sichuan PCS Factory

*PCS R&D Teams
Production Capacity
1GW/year*



Shenzhen Battery System Integration Factory

*Prismatic Cell Pack & System Integration
Production Capacity
1.2GWh/year*



Yichun Battery System Integration Factory

*Prismatic Cell Pack & System Integration
Production Capacity
3.2GWh/year*

Dawnice NEW BESS Plant Layout

The factory covers 333,000m² land, Total production capacity :6GW/12GWh

The first stage capacity is 3GW/3.2GWh(73,333m²) ,Mass production is scheduled begin in *January 2022*.



Battery Pack Assembling Line Building



Container Integration Assembling Line



PCS, DCP, ACP, Control Box Assembling Line



General Administration Building



Research & Development

100+

Different Brand and Type of battery Cells

10+ years

experience in energy storage system development

1300+

Patents

Independent R&D



System Integration

**Safety Evaluation
Performance Evaluation
Cycle Life Evaluation
Application Evaluation**



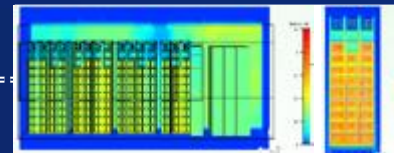
Module&Pack Technologies



BMS Technologies



Electrical design



Thermal design

National ESS Lab



Chapter

02

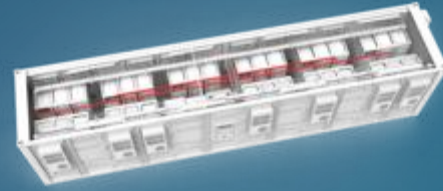
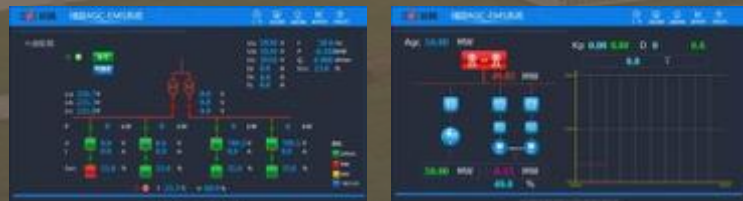
Product Profile



EMS is a centralized energy management and data monitoring center for the whole energy storage power station system

- Data acquisition
- Control function
- HMI

Energy Management System



Battery Storage System

- Battery Management System(BMS)
 - Battery Mould&Pack
 - Battery Rack
 - Battery Cooling System
 - Battery Fire Suppression System
 - DC/AC Panel
- IEC/UL/ CE/GB-T certified

Complete product range(30kW~4000kW) , compliant to IEEE standards and applicable to various applications. Real-time active/reactive power scheduling & LVRT functions.

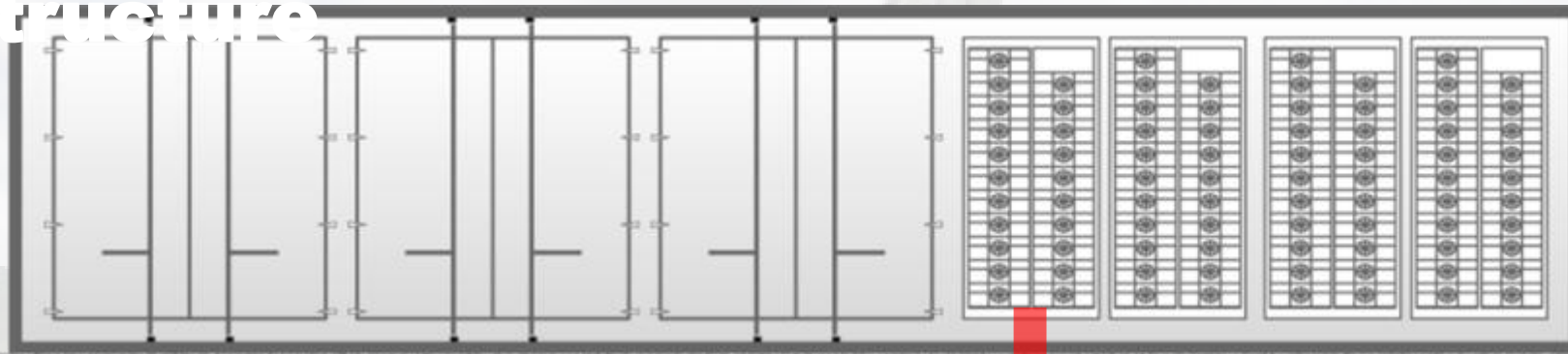
Advanced droop control method, up to 99% power sharing efficiency for parallel connection of voltage sources .

IEC/UL/ CE/GB-T certified

Power Conversion System



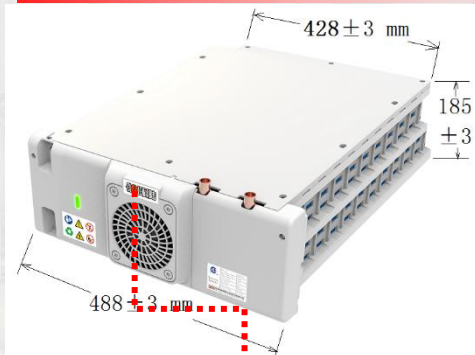
Battery System Products Structure



Battery Array

Energy Unit

Battery Module



Battery Cluster



Battery Management System

BMU



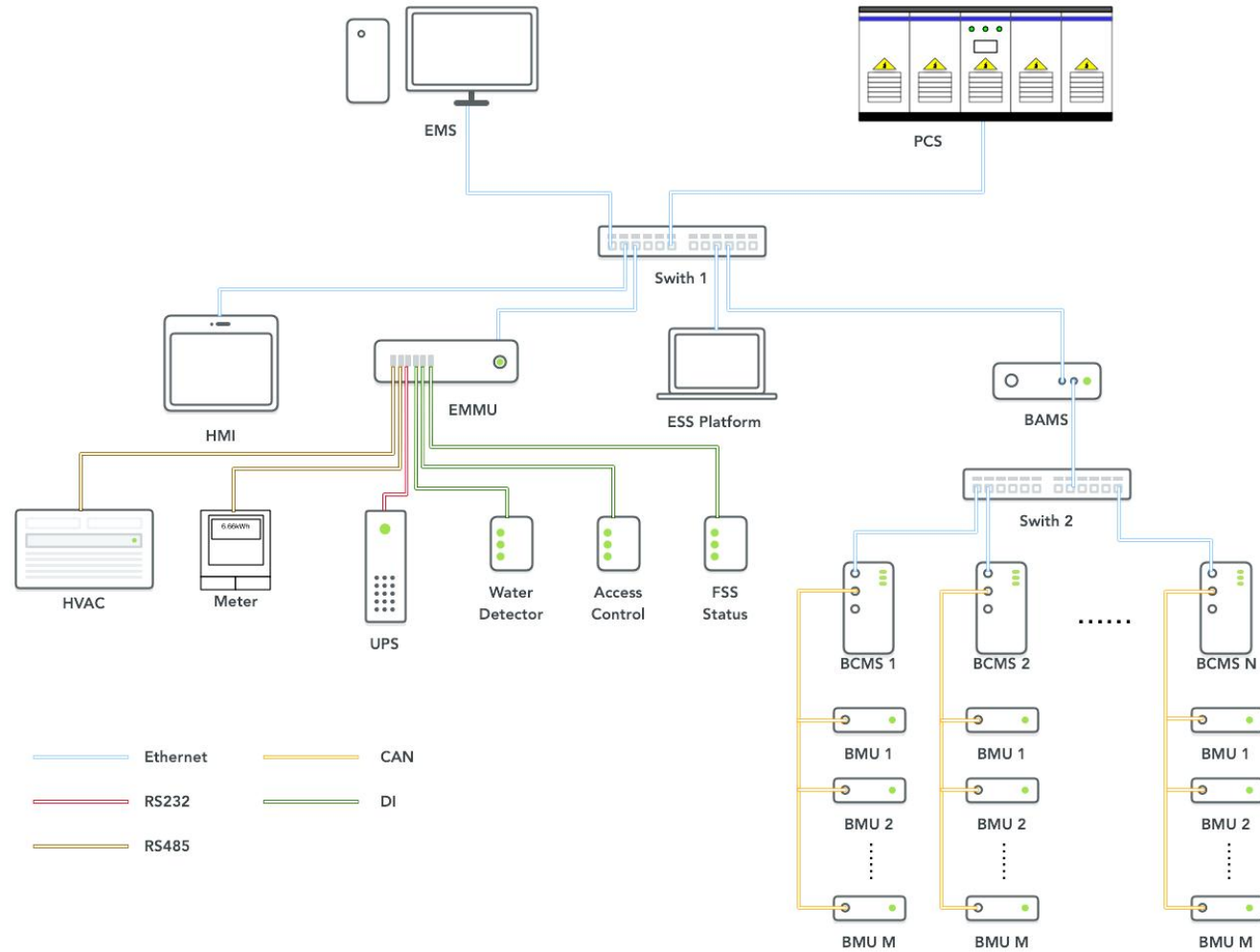
BCMS



BAMS



Communication Structure



Battery Air Cooling Container

Classic layout of 40ft HC Standard Container



Max. Capacity 6580kWh/4600kWh

Max. C-rate 0.25CP/1CP

Max DC Voltage 1500V

Protection Level IP54

Weight(kg) 68000kg

Dimensions(W*D*H) 12192*2438*2896

Cooling Method Forced-air

Fire Suppression FM200, Novec1230, Aerosol

Altitude 2000m(>2000m Derating)

Ambient Humidity -20~45°C

Ambient Temperature 0-95%RH

Battery Air Cooling Container

20ft HC DC 1500V Standard Container layout



Max. Capacity

5268kWh

Max. C-rate

0.5CP, 2h duration

Max DC Voltage

1500V

Cell Capacity

280Ah

compatibility

Up to 5 units(20 ft per unit)

Free-installation

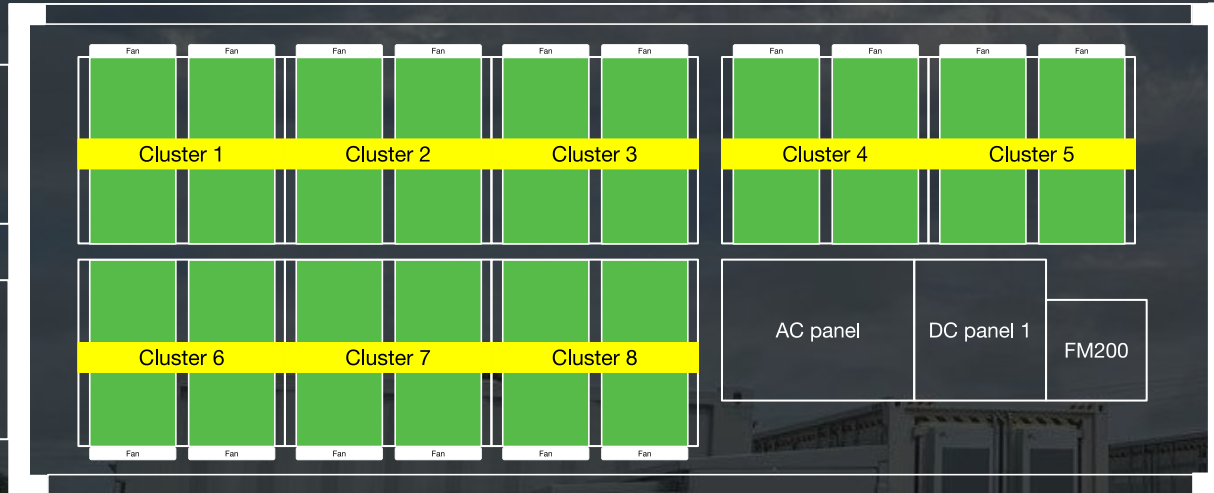
This product is designed from the perspective of reducing customer site work, and the overall weight of the container is designed below the maximum allowable transport weight, so it can be transported as a whole without removing the module

50% faster installation and Reduce 30% CapEx for on-site installation
15% energy density increase

Battery Air Cooling Container

20ft HC DC 1200V Standard Container layout

20ft



20ft



Max. Capacity

5178kWh

Max. C-rate

0.5CP

Max DC Voltage

1200V

Cell Capacity

280Ah

Flexible-configuration

It can match the PCS with AC side voltage of 900~1300V, making the system integration solutions more flexible

Battery Liquid Cooling Container

Model E30

Product Characteristics

- Support **DC1500V voltage** platform, flexible access
- Liquid cooling, no aisle design
- Rapid deployment and networking, **turnkey solutions**
- **1CP+** sustained high power output capacity
- Super long life cycle, **8000+** cycles
- High energy density equal to 7MWh in a 40 feet container
- **Cycle life enhance 10%, temperature deviation: within 2 °C**
- **10% reduction in auxiliary consumption**



Max. Capacity 2500kWh

Max. C-rate 1CP

Max DC Voltage 1500V

Protection Level IP54

Weight(kg) 25000kg

Dimensions(W*D*H) 9292*1438*2896

Cooling Method Liquid

Fire Suppression FM200, Novec1230, GAFES

Altitude 2000m (>2000m Derating)

Ambient Humidity -20~45°C

Ambient Temperature 0-95%RH

PCS



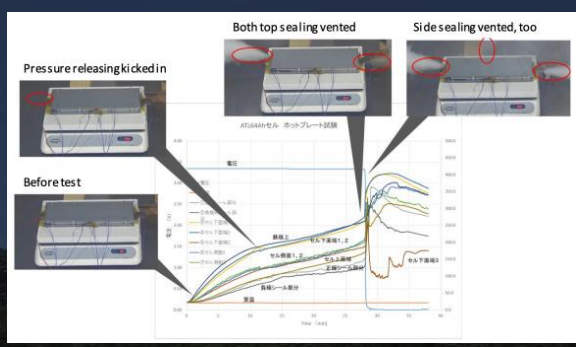
NEPCSH-4000/3200/2800/2400



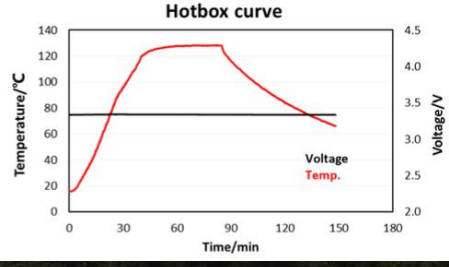
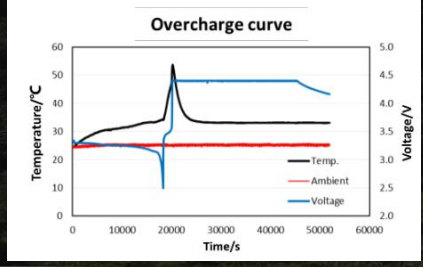
NEPCS-2000/1600/1400/1200

DC Voltage Range	915-1500V/800-1500V/700-1200V	915-1500V/800-1500V/700-1200V
Max. DC Current	3934A	1967A
Nominal AC Power	3200/2800/2400kVA	1600/1400/1200kVA
Max. AC Power	3528/3080/2688kVA	1764/1540/1344kVA
Max. AC Current	3234A	1617A
Nominal AC Voltage	630/550/480V	630/550/480V
Nominal Grid Frequency	50Hz,60Hz	50Hz,60Hz
Power Factor	>0.99	>0.99
Max. Efficiency	98.8%	98.8%
Dimensions	2991*2591*2438	1906*2264*800
Weight	6000kg	1680kg
Protection Degree	IP54	IP20
DC Input Protection	Load Switch + Fuse	
AC Output Protection	Circuit Breaker	
Protection	Overvoltage, Ground Fault, Insulation Monitor, Overheat	
Compliance	GBT 34120-2017, UL1741, UL1741SA, IEEE1547, PSCAD+PSSE Model, Arc flash analysis	

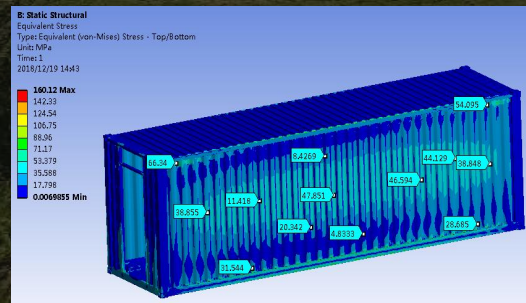
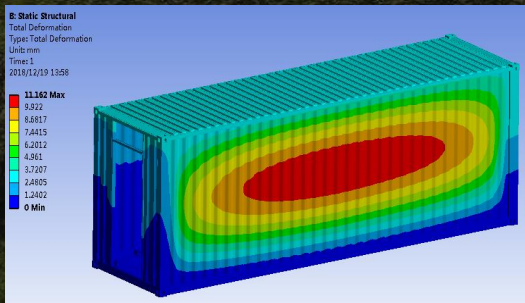
Battery Storage System Integration Safety Design



- Safe LiFePO4 Chemistry
- Complete-system Engineering for Safety & Reliability
- Safety for Lifetime
- 9540A
- Absolute Safety under Extreme Conditions
- 0 Risk of Explosion



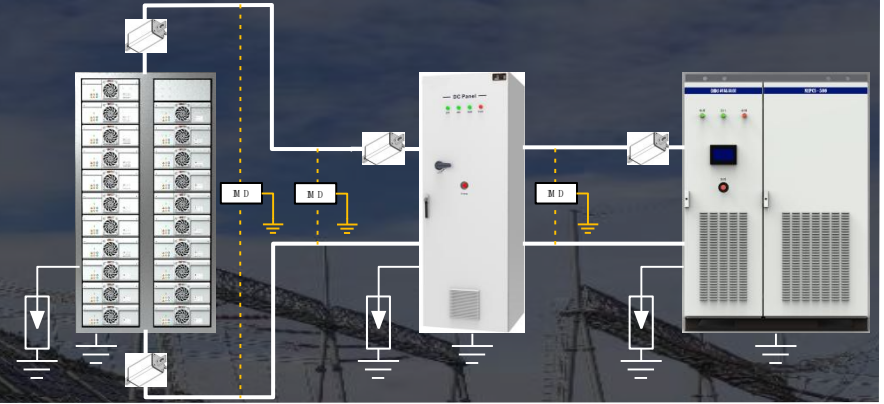
- Wind load strength: Under the condition of 15 typhoon (wind speed 46m/s), the maximum deformation of the container is 11.162 mm, which meets the requirements of IICL-5 35mm.
- Seismic strength: using modal response spectrum method, refer to IEEE Std 693-1997, UBC97/ IBC2000, can withstand 9-stage crack.



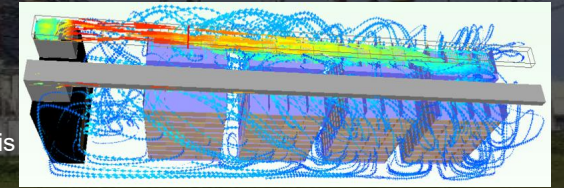
Cell safety **Electrical safety**
Structure Safety **Thermal management**

IEC 62619 IEC 62933
 UL9540 UL9540A UL1973 UL1741
 NFPA 72 NFPA 70E NFPA 855
UN38.3

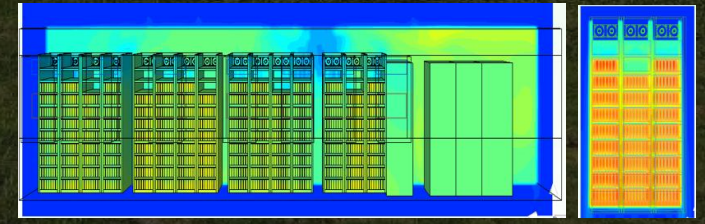
- Surge protection is added on the battery side, power grid side, and communication interface to effectively suppress external residual voltage, lightning electromagnetic pulse, and common mode voltage
- Each device uses an independent grounding method to ensure the normal operation of the device.
- Three-level insulation detection on the DC side, decoupled from each other, and do not interfere with each other, can detect the insulation resistance of the entire DC side circuit to ground
- Three level fuse:
 - Rack +/- poles fuses
 - DC BUS fuse
 - DC Side fuse



- Thermal simulation provides theoretical basis for HVAC selection.
- Environment temperature is 25±5°C.



- Under 1CP condition, the temperature rise and deviation of the whole container are both 8°C.



- Special air duct design and separated fans make the temperature deviation of module is within 3°C.



Chapter

03

ESS Case



Dawnice is a self-invested, self-built, self-developed, self-operated energy storage integrator

ESS CASE

200+

Global ESS
Project

6000+

Equivalent
Cycles

180+ GWh

Cumulative
Discharge

700+ Days

Trouble-free
running time



6600 cycles

charge: >77.4GWh

Discharge : >71.3GWh

Hai Feng AGC



6500+ Cycles

Yun Fu AGC



3500+ Cycles

XuanHua AGC



4000+ Cycles

LiYuJiang AGC



3500+ Cycles

ZhunDa AGC

Texas U.S.A / 2020

Application: Energy Trading & FR

Capacity: 90MW/99MWh

COD: July/2020



Indiana U.S.A / 2021

Application: Peak shifting

Capacity: 19.2MW/47MWh+24MW/63MWh[under delivering]

Estimated COD: July/2021





Rwanda/ 2019

Capacity: 1.5MW/3.3MWh

Application: Micro-grid

Project Significance: Rwanda's first integrated light storage project to power universities



Micro-grid ESS in Japan

Time: 2018

Project Capacity: 2.4MWh

Application: PV+ESS

Haifeng / 2018

Capacity: 30MW/14.938MWh

Application: Frequency regulation for power plant



Inner Mongolia / 2018

Capacity: 18MW/8.957MWh

Application: Frequency regulation for power plant



Zhenjiang / 2018

Capacity: 12MW/24MWh

Application: Peak shifting



Changsha / 2018

Capacity: 10MW/20MWh

Application: Peakshifting for the Grid



Beijing / 2017

Capacity: 3MW/6.2MWh

Application: C&I Demand Response

Project Significance: greatly reduced the enterprise's electricity cost and improved its power supply reliability.



Yushu / 2015

Capacity: 79MWh

Application: Off-grid distributed solar station +ESS

Project Significance: Supplies daily electricity to farmers and herdsman in electricity-free areas in western China





Tibet / 2016

Capacity: 3MW/10.08MWh

Application: Micro Grid

Project Significance: Innovative thermal design ensures long-term stable operation under extreme circumstances

Thanks

