

500kW/1000kWh Project Proposal



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PART 01

General Introduction

General Introduction

Based on lithium iron phosphate battery(LFP) and power conversion technology, designed the modular containerized battery energy storage system (BESS),which was successfully used in many scenarios, such as photovoltaic absorption,back-up, DSR.



Key Features

1. Standardized design, modular assembly, flexible capacity configuration.
2. Intelligent integrated management, battery module plug and play, simple and reliable operation and maintenance.
3. High energy density, high system conversion rate, to ensure the maximum electricity consumption.
4. The cascade protection mechanism of software and hardware combination, the comprehensive insulation monitoring algorithm, to ensure the system security.
5. Fast response speed, support for instantaneous full power input and output.
6. Advanced heat dissipation temperature control design, to ensure the working temperature consistency, prolong the service life.
7. The self-developed BMS battery management system has a comprehensive battery management strategy and data analysis, and supports the local backup and storage of data.
8. Advanced active equalization algorithm, increase the depth of system use.

Key Features

1. With automatic calibration algorithm, automatic calibration correction system SOC.
2. With the energy storage visualization platform to realize the full life cycle monitoring and recording of the battery system(optional).
3. Compatible with Ethernet, RS485 and other communication interfaces and mainstream standard protocol protocols, can also provide customized solutions.
4. Support EMS scheduling, and participate in the formation of the energy Internet.
5. Supports SCADA software monitoring and WEB direct access control.
6. Support system self-inspection and protection, and provide remote upgrade service.
7. With an intelligent cloud platform system, supporting cloud sharing, big data analysis and report statistics, analysis of operation status(optional).
8. Integrated energy storage converter, integrated solution, reduce the field installation process, plug and play, fast station construction, convenient and efficient.

Project Requirements

1. Application

Microgrid

2. Supply scope

BESS+PCS+STS

3. Performance requirement

Battery type : LFP

Nominal power/capacity (minimum) : 500kW/1000kWh

Compliance : IEC62619:2022,IEC60730-1,EN62477-1:2012,EN61000-6-2,UN38.3

Project Configuration

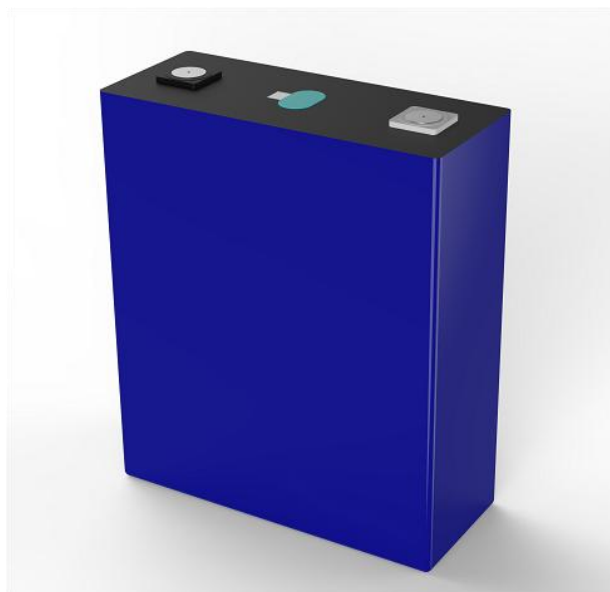
One system will be supplied that including battery system and PCS with isolation transformer and BTS, and the configuration is listed below. The installed capacity is 1000kWh for each container.

Items	Description		QTY	Remark
			pcs	
1	Lithium Battery	51.2V280AH	70	Including 16cells in 16series-1parallel connection,14.336 kWh*70PCS=1003.52kWh.Each rack(cluster) includes one control box and 14 modules.Including BMU for battery module, BCU for battery cluster and BAU for battery system, Active balancing current: 1-2A
2	Battery racks	14 pcs in series/rack	5	
3	High voltage control box	1000V250A	5	
4	High voltage control cabinet	1500V1000A	1	
5	PCS with isolation transformer	500KW	1	PWS1-500KTL-EX-8M1, 500kW with isolation transformer.
6	STS (on and off-grid Automatic switching)	800KVA	1	Switch between grid-connected and off-grid modes and Grid-tied/off-grid switch time<20ms
7	Container (including airconditioner3kw*6pcs/lighting System/Ventilation system/ fire fighting)	6.058m*2.438m*2.591m (20ft)	1	CoolingCapacity: 18kW Anticorrosion grade: C4 All sides(foursides,top and bottom) will have proper insulation
8	Internal connection cable		1	

PART 02

System Configuration

Cell Specification



Item	Parameter
Nominal Capacity	280Ah
Max. charging/discharging current	280A
Nominal Energy	896Wh
Nominal Voltage	3.2V
Voltage Range	2.8~3.55V
Weight	5490g
Dimension (H/W/T)	207.2/ 173.7 / 71.7mm

Module Specification



Item	Specification
Configuration	1P16S
Rated Capacity	280Ah
Rated Voltage	51.2V
Voltage Range	44.8~56.8V
Rated Energy	14.336kWh
BMU	Battery Management Unit/ Active balancing current: 1-2A
Weight	110kg
Operating Temperature	0~45°C
Recommended Temperature	25~35°C
Humidity	0~95% RH (Non Condensing)
Dimensions	Depth: 800mm
	Width: 435mm
	Height: 234mm

High voltage control box Specification



Item	Specification
System Operation Voltage	≤1000V
Operation Current (Max.)	250A
BCU	Battery Control Unit
Self-consumption Power(W)	8
Communication	MODBUS RTU/CAN
Discharge temp.	-20℃ ~ 45℃
Charge temp.	0℃ ~ 45℃
Dimensions	Depth: 400mm
	Width: 440mm
	Height: 177mm

High voltage control Cabinet Specification



Item	Specification
System Operation Voltage	DC 1500V
System Operation current	DC 1000A
BAU	Battery Array Unit
UPS	DC72V/AC220V/3kVA/2.4kW
UPS battery	12V24AH*6PCS
Switching power supply	Input voltage 85 ~ 264VAC/ Output voltage DC24V
Fuse	DC1500V/250kA/
Dimensions	Depth: 800mm
	Width: 800mm
	Height: 2100mm

PCS Specification

Power Conversion System



Item	Specification
Nominal power	500kVA
Battery voltage range	600~900Vdc
Quantity of battery strings	1
DC max current in each branch	880A
Rated AC output power	500kVA
Max. AC output power	550kVA
AC frequency	50/60(−2.5~2.5) Hz
AC output voltage	380/400(±10% configurable) Vac
Operating ambient temperature	−20°C to 50°C (De-rating over 45°C)
AC connection	3-Phase 3-Wire
Communication	RS485, CAN, Ethernet
Enclosure	NEMA1 IP20 and optional IP54 with outdoor cabinet
Protection	OTP, AC OVP/UVP, OFP/UFP, EPO, AC Phase Reverse, Fan/Relay Failure, OLP, GFDI, Anti-islanding
Certification	CE LVD IEC 62477, CE EMC IEC 61000 EN 50549-1:2019, EN50549-2 G99, AS4777.2:2020, VDE 4110, CE10-16 Synergrid listing
Weight	Cabinet 280kg + Module 40kg*n (n=1,2,...,8)
Size (W×H×D)	1100×2160×800 mm

STS Specification (Smart Transfer Switch Cabinet)



Item	
Nominal output power	800kW
Nominal grid voltage	400V
Long-term output overload capacity	1.1
Grid-tied/off-grid switch time	<20ms
Nominal current	1215A @380Vac, 1154A@400Vac
Max. current	1336A @380Vac, 1269A@400Vac (1.1 times)
Max on-load switching power	500kW (RCD load、 pure capacitive load or inductive load is less than 100kW)
Temperature range	-20℃~50℃
IP degree	IP20
Weight	450Kg
Dimensions (W × H × D)	800*800*2160mm

Battery Container Specification

20 feet container



Item	Specification
Outside size	6.058*2.438*2.591 M
Inside size	5.898*2.338*2.318 M
Internal air-conditioning power	3KW*6pcs
Anticorrosion grade	C4
Door sealing tape applicable ambient temperature	-30°C~80°C
Heat preservation form	Rock wool insulation
The protection level	IP55
Type of Installation	■ Outdoor
Included ventilation system and lighting System and battery racks and fire protection system	

