500kW/1075kWh

Containerized Lithium-ion Battery Energy Storge System

Product Specification

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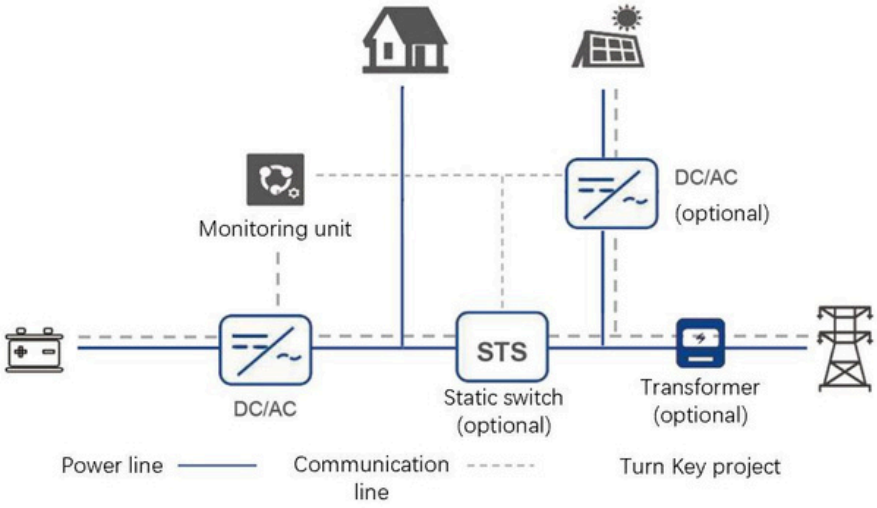
Content

1. Introduction of Containerized Energy Storage System

The integrated container energy storage system consists of battery clusters, bidirectional energy storage converters (PCS), battery management system (BMS), energy management system (EMS), fire control system, lighting system, dynamic ring control system, access control system, isolation transformer (optional), and so on. Multiple monitoring of system status and hierarchical linkage constitute a comprehensive protection system integrating electrical safety and functional safety. Container system, standardized, prefabricated design, reduce user customization time and construction costs, reduce the security risks caused by local installation differences and management risks. Meet the regional power grid peak regulation, frequency regulation, voltage regulation, emergency response, new energy consumption and other application needs to ensure the normal operation of the power system. configuration

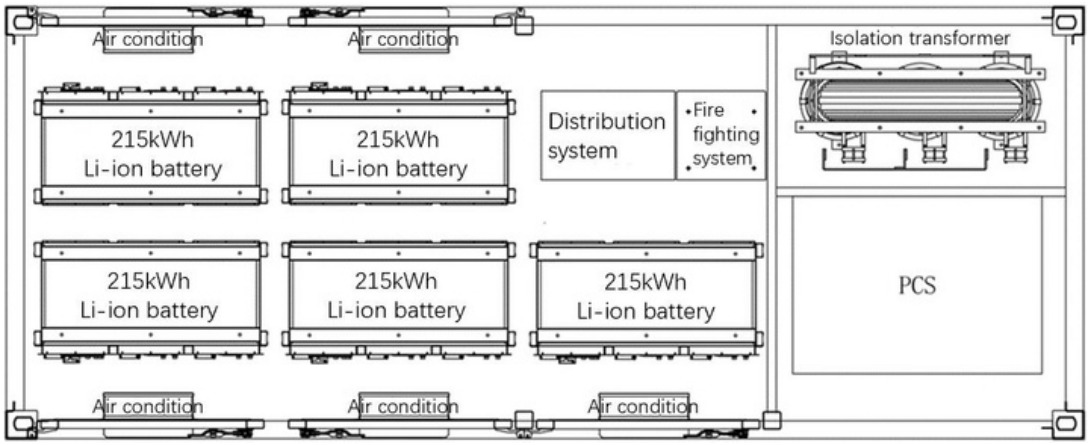
1. BMS： The lithium battery cluster system is mainly composed of safe, efficient and long-life LiFePO4 cells through series and parallel connection to form a battery module,
2. multiple modules in series to form a battery cluster
   Battery management system： The core components of the system effectively protect the
3. battery overcharge, overdischarge, overcurrent, etc., and take balance management on the battery cell to ensure the safe, reliable and efficient operation
4. of the entire system. Monitoring system： System operates data monitoring, strategy management, historical
   data recording, system status recording, etc.
5. PCS： The bidirectional AC/DC converter can realize the bidirectional conversion of DC
   to AC and AC to DC, which can convert AC to DC to charge batteries, and also convert
   DC to AC to power the load or feed back to the grid.
   Air conditioning： The battery cabinet integrates 5kW industrial air conditioning (one for
   each cabinet) to meet the smooth operation of the system in different environments and
   extend the service life of the system.

System topology



Equipment appearance diagram:

Top view of equipment arrangement:



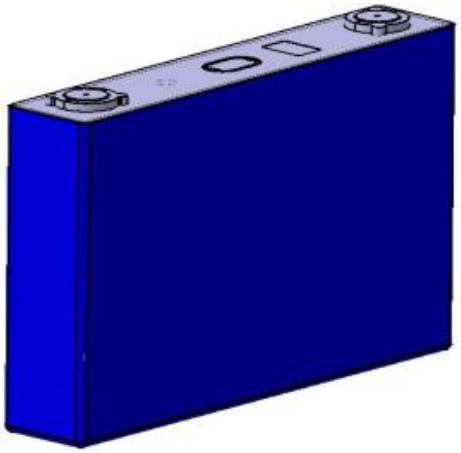
2、Basic parameters

AC parameters (Grid-connection)	Rated power output (kW)	500
	Maximum output power	550
	Rated grid voltage(V)	3W+N+PE, 380/400V
	Grid voltage range	-15%~+10%
	Rated grid frequency (Hz)	50/60
	Grid frequency range (Hz)	±2
	Output current harmonics	≤3% (Rated power)
	DC component	<0.5%In
	Power factor	-0.9~+0.9
	Overload capacity	105%]: keep running 105%~120%]:10mins 120%):stop running
AC Parameters (Off grid)	Rated output power (kW)	500
	Maximum output power (kW)	550
	Rated output voltage (V)	3W+N+PE, 380/400V
	Output voltage harmonics	3% (Linear full load)
	Rated frequency(Hz)	50/60
	Overload capacity	105%]: keep running 105%~120%]:10mins 120%):stop running
Battery parameters	Battery type	Lithium iron phosphate
	Single battery cabinet (kWh)	215.04
	Battery cabinet number	5
	Battery system capacity (kWh)	1075
	Rated operating time (h)	2 (The operating time can be changed according to the number of battery modules)
	Battery life	25°C 0.5C/0.5C 100%DOD EOL80% ≥6000 times

Efficiency	Maximum efficiency	93%
Protection	AC switch	Yes
	Grid monitoring	Yes
	Surge protection	Yes
Basic parameters	Size(L*D*H) (mm)	6058*2438*2591
	Weight(kg)	16000
	Isolation mode	Built-in isolation transformer
	Grid and off-grid switching device	STS
	Protection class	Outdoor IP54
	Working temperature range	-20~55°C(>45°C derated)
	Relative humidity (non-condensing)	0~95%
	Temperature control mode	Air conditioning
	Maximum working altitude (m)	4000(>2000 derated)
	Display	Touchscreen
	Communication interface	RS485、CAN、LAN
	Communication protocol	Modbus-RTU、Modbus-TCP、CAN2.0B

3、Main equipment parameters

3.1 Battery cell



The cells adopt 3.2V 280Ah with square aluminum shell design, which can avoid the

possibility of built-in damage of the cells caused by mechanical damage of the cell's surface, and improve the safety performance of the product. A thin-film explosion-proof valve is installed on the battery, which can also ensure that in any extreme circumstances (such as internal short circuit, overcharge of the battery, etc.), a large amount of gas that rapidly gathers inside the battery can be discharged through the anti-riot valve, which can ensure that the battery will not explode, therefore, the selection and design of the battery has fully considered the safety of the battery and the system.

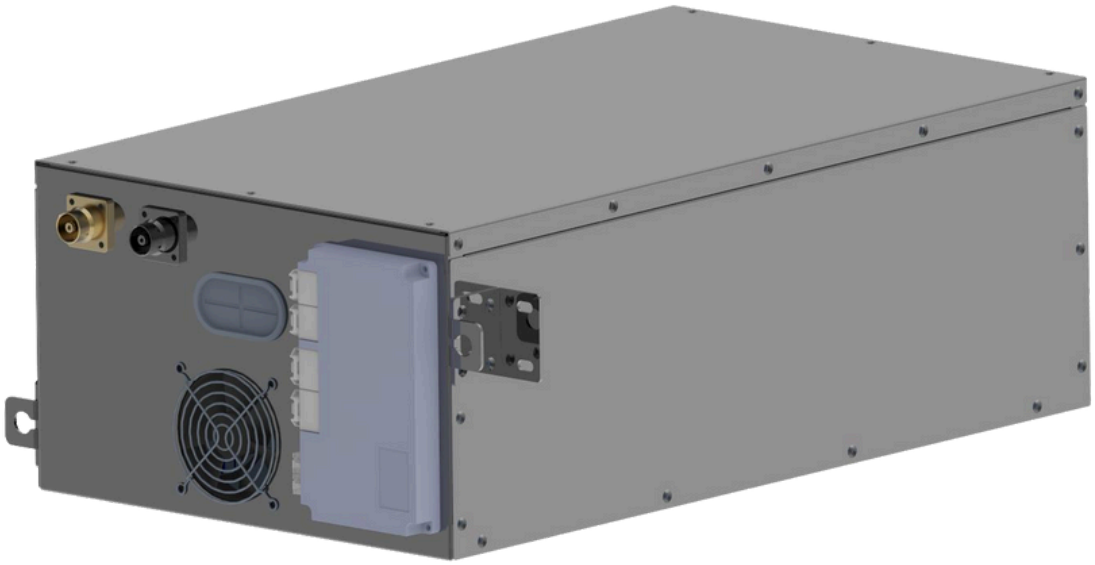
Single cell general parameters

Content	Parameters	Condition
Cell type	Lithium iron phosphate cell	N.A
Cell module	LFP71173207/280Ah	N.A
Dimension	71.65*174.7*207.11mm	
Cell quality	5.43±0.20kg	After wrapping in blue film
Delivery internal resistance(1kHz)	0.18±0.05mΩ	27%SOC，The online test data shall prevail
Rated (nominal) capacity	280 Ah	(25±2)°C，Standard charge and discharge
Rated voltage	3.2V	25±2)°C，Standard charge and discharge
Rated power	896 Wh	25±2)°C，Standard charge and discharge
Operating voltage	2.5-3.65V 2.0-3.65V	T>0°C T≤0°C
Delivery voltage range	3.28~3.30V	(25±2)°C，27%SOC Open circuit voltage of the cell
Energy density	≥160Wh/kg	(25±2)°C，Standard charge and discharge
Recommended SOC window	10%~90%	N.A
Monthly self-discharge	≤3.0%	Battery cells after three-month shipment, standard charge to 27% SOC, 25±2 °C storage
Charging power	0.5P	
Discharging power	0.5P	
Discharge temperature range	-30~60°C	N.A
Charging temperature range	0~60°C	N.A
Operating temperature condition	(25±5)°C	N.A
Cycle number	6000 times; 25±2°C Standard charge and discharge test until capacity decays to 70% of	

	nominal capacity	
Power efficiency	＞90%	

3.2 Battery module

Adopting 3.2V280Ah*12 lithium iron phosphate cells connected in 12 series and 1 parallel to form a 38.4V280Ah battery module.

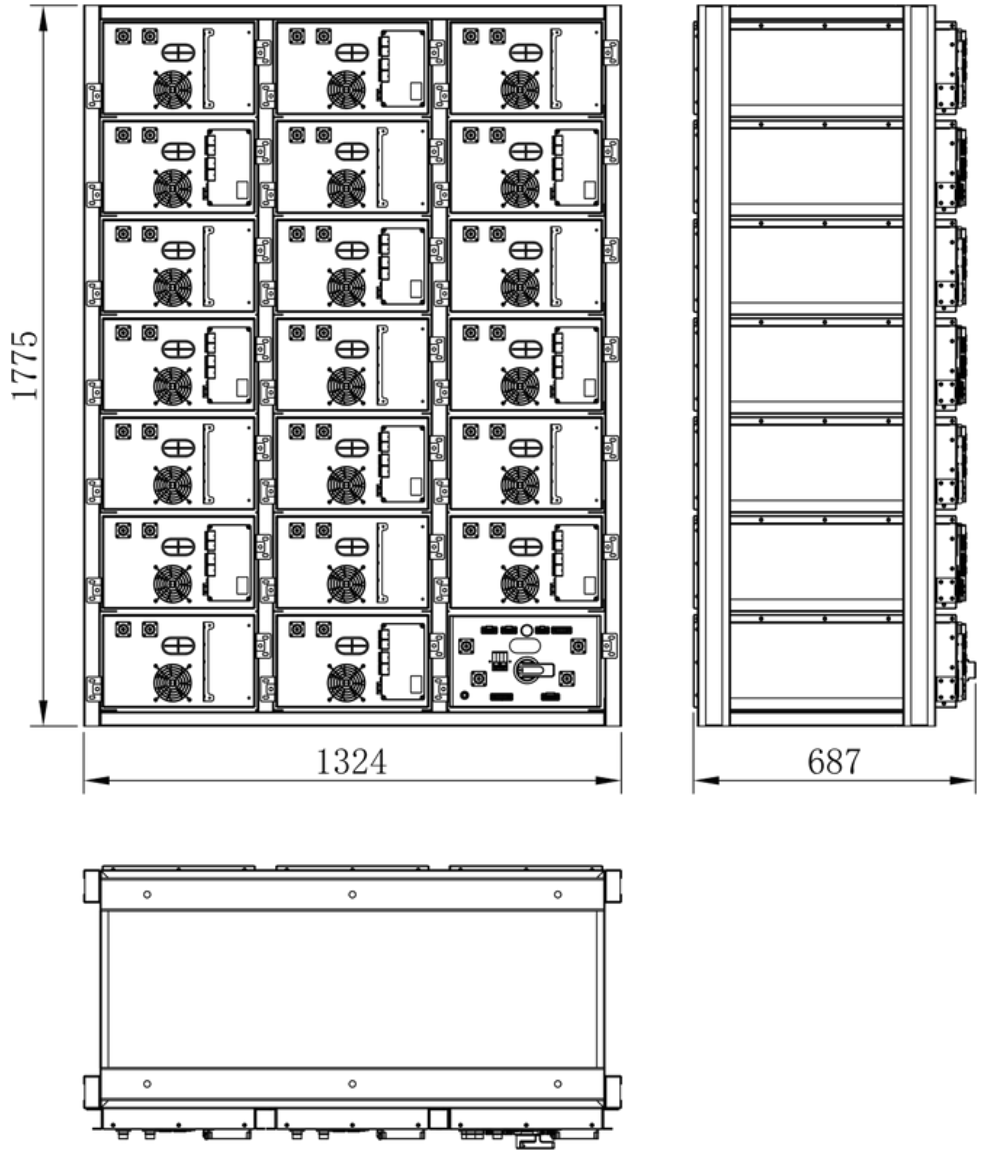


Battery module parameters

Content	Specification
Cell module	Energy battery
Component part	12Cells，BMS
Connection mode	12S1P
Nominal capacity	280Ah
Nominal voltage	38.4V
Weight (kg)	<90
Operating voltage range	30V ~43.8V
Maximum continuous discharge power(kW)	10.752（1C）
Terminal output	Connector
Dimension（W*D*H）mm	370*677.5*230mm
Communication method	CAN

3.3 Battery cluster

The battery in this solution is integrated in the container battery rack, a total of 5 clusters, each cluster is equipped with a professional BMS battery management system.



Battery cabinet parameters

Content	Parameters	Condition
Cell capacity	280Ah	Standard charge and discharge
Connect method	1P240S	N.A.

Nominal voltage	768V	Standard charge and discharge
Nominal capacity	215.04kWh	Standard charge and discharge
Overall size(W*D*H)	1324mm*687mm*1775mm	See drawing
Weight	<2T	N.A.
Discharge cut-off voltage	672V or any battery cells in the cluster reaches 2.8V	T＞0℃
Charge cut-off voltage	672V or any battery cells in the cluster reaches 2.8V	N.A.
Rated charge/discharge current	140A	(25±2) ℃
Working temperature range	-20~50°C (discharge) 0~50°C (charge)	N.A.
Storage temperature range	-20~50°C	N.A.
Communication method	CAN	N.A.
Delivery SOC (%)	30	(25±2) ℃
Operating temperature condition	(25±5) °C	N.A.

4、Configuration list

No.	Content	Specification/Type	Number	Unit	Remark
1	Set of 20-foot standard container	6058*2438*2591(mm)	1	PCS	
2	PCS	EPCS500	1	PCS	
3	Battery cabinet	BESS768-280	5	PCS	Including com-plete sets of BMS, high pressure box, etc.
4	Industrial air conditioning	Wall-mounted 5kw	5	PCS	
5	Fire protection system	Pibe network	1	set	
6	Power distribution and lighting system	Customized, complete set: switches, leakage protection, lamps, etc.	1	set	

5、Schematic diagram of inlet and outlet lines