



Product Specification

100kW/215kWh
Energy Storage System

JOYKO

1. Overall system plan

1.1, system overview

JOYKOO 215 Intelligent industrial and commercial energy storage system, using All-in-one design concept, the cabinet integrated battery, battery management system BMS, energy management system EMS, modular converter PCS and fire protection system in one. The battery capacity is 215kW h, and the power is 100kW. The modular design is flexible for capacity expansion, and it is adapted to power capacity expansion, backup power supply, black start and other scenarios. Can be flexible in a variety of industrial and commercial parks, hospitals, schools, mining areas, airports, gas stations and other scenarios.

1.2, Product advantages

Greater economy

- Lithium iron phosphate adopts over 300Ah capacity cell; lower attenuation, higher cycle life;
- Modular PCS design, support parallel, easy to expand, improve system consistency and efficiency 3%~5%;
- Under normal set conditions, a single JOYKOO 215 can release 200kWh + energy;

Stronger safety

- Add to the battery protection layer of the battery management system, and multiple layer of protection redundancy design makes safety impeccable;
- Smoke, temperature, CO concentration, and H₂, VOC, water immersion fire detection, to achieve comprehensive monitoring;
- PACK grade fire protection and aerosol fire extinguishing agent to ensure environmental protection and safety;

Better experience

- Remote scheduling, real-time monitoring, fault recording, to realize the system performance monitoring and log recording;
- The whole machine weight is 2.6T, covering an area of 1.8 m²; all pre-assembled, no battery module handling on site, fast installation and debugging;
- Support up to 24 parallel machines, which can be elastic capacity expansion;

Better service

- Comprehensive technical support in the early stage, including capacity analysis, technical solutions, customer communication, feasibility study design, etc.;
- Mid-term one-stop service, including site survey, drawing design, customized design, etc.;
- Later rapid response, including on-site debugging, operation and maintenance training, long-term technical consulting services, etc.;

2. Energy storage system

2.1 System parameters

tractor parameter	
System Rated Energy (kWh)	215
Rated voltage (V)	768
Voltage Range (Vdc)	725-840
Charge / discharge rate (C)	≤0.5
depth of discharge	95%
Cycle life (times)	≥8000
fire extinguisher system	aerosol
Rated power (kW)	100
AC-current harmonics	3% (at the rated power level)
direct component	1% (at the rated power level)
Rated AC voltage (Vac)	380/400
The AC-voltage range	-15%~+10%
Rated Grid Frequency (Hz)	50/60
Dimensions (WxDxH, mm)	1520*1270*2117
weight (T)	2.6
levels of protection	IP 55
Operating temperature range is (°C)	-20- + 55 (> 45 drop)
Running wet, degree range	0-95% (no condensation)
Working altitude (m)	4000 (2000 drop)
cooling-down method	forced air cooling
System communication interface	RS 485,Ethernet
System communication protocol	ModbusRTU,ModbusTCP ,IEC 104
Battery parameters	
Battery type	LFP ,3.2V280Ah
Battery module	64V 280Ah ,17.92kWh,140.5kg
Battery cluster configuration	240S1P
Battery cluster-rated energy	215.04kWh

2.2 Cell parameters

Project		Condition	Specifications
Nominal capacity		0.5C, with the discharge capacity	280Ah
Communication internal resistance		Measured at 1000Hz	0.18±0.05mΩ
Nominal voltage			3.2V
Cell size		size	W: 174.7mm
			T: 71.65mm
			H: 207.11mm
Battery weight			5.43±0.20kg
Charge off, stop voltage		constant-current charging	3.65V
Charge off, stop current		constant-voltage charging	≤14A
Charging method		Standard charging	≤0.5C at CC/CV
Discharge cut-off voltage		constant-current discharge	2.5V (temperature > 0°C) 2.0V (temperature ≤ 0°C)
Nominal charge and discharge current			0.5C
Circulating performance		0.5C/100%DOD	≥8000 cycles
Operating temperature range	Charging temperature		0~60°C
	Discharge temperature		-30~60°C
	Storage temperature		-20~45°C

3. Fire control system

According to the different severity of battery thermal runaway, electrolyte leakage, initial electrical fire, battery thermal spread, to achieve multi-stage warning and convenient operation and maintenance. The fire protection system of the energy storage power station implements the hierarchical early warning mechanism and adopts multi-level fire treatment and control, which can effectively reduce the large-range fire risk of the energy storage system and effectively guarantee the safety of the energy storage system.

The main features of the fire protection system are as follows:

- The system can automatically detect the fire, automatic alarm, and automatically start the fire extinguishing system;
- With automatic control, manual control and mechanical emergency operation;
- Independent emergency manual operation mechanism;
- Equipped with alarm bells and sound and light alarms for fire and fire extinguishing agent release;
- Self-inspection system, regular automatic inspection, monitoring fault and fault alarm.

Intelligent fire protection system is well-designed in the battery cabinet. Fire fighting adopts aerosol / perfluorohexanone automatic fire extinguishing system, composed of smoke temperature sense detection device, fire alarm host, fire extinguishing device and auxiliary actuator. The fire extinguishing device adopts canned aerosol / perfluorhexone, and the aerosol / perfluorhexone fire extinguishing device links with the fire detection and alarm system to realize the functions of automatic detection, alarm and fire extinguishing protection in the protection area. Fire extinguishing agent, aerosol / perfluorohexone, high fire extinguishing efficiency, no damage to equipment, good electrical insulation, rapid fire extinguishing.

First-level alarm: smoke, temperature, CO concentration, H₂, The VOC concentration exceeds the standard. Response action: the alarm unit sends out an alarm, display and control unit focus on the relevant super standard parameters, and notify the personnel on duty in time.

Secondary alarm: smoke, temperature, CO concentration, H of two detectors in the same battery pack², VOC concentration and other five parameters have simultaneously exceeded the threshold. Response action: the alarm unit sends out an alarm, display and control unit focus on the relevant super standard parameters , and notify the personnel on duty in time.

Level alarm: smoke, temperature, CO concentration, H of multiple detectors in different battery packs2, VOC concentrations simultaneously exceeded this threshold. Response action: the alarm unit sends an alarm, the data processing unit is connected to BMS, turn off the power, and start the backup power. The source treatment unit performs field spraying (aerosol / perfluorohexone spraying) on the entire engine room.

4. Thermal management system

- Standard PTC heater, several groups with air supply, refrigeration, heating and site flexible configuration dehumidification function;
- RS485 communication interface;
- High-speed and reliable CAN communication network group control;
- Multiple alarm output, multiple protection functions.

class	name	parameter
Performance and configuration	Total cooling capacity	5.0kW
	blowing rate	1500m ³ /h
	Add heat	3k W
	cryogen	constant temperature
	noise grade	R134a
	Fan type	fixed frequency
	levels of protection	A C
Power system	Power type	I P 55
	maximum current	220Vac/50HZ
	air-break	17.6A
else	size	W 670*D296*H1400mm
	way to install	hanging
	application environment	Outdoor-40°C ~55°C
	quality	About 105kg

5. Energy storage converter

The energy storage converter adopts optical storage and grid-connected all-one machine. The system has low loss, high efficiency, low cost, small footprint and maintenance

Convenience and other advantages. The specific parameters are shown as follows:

AC and, network parameters	
power rating	100KW
maximum output	110KW
Allowable voltage of the converter	400Vac (-15%~10%)
Allowable frequency of the converter	50/60HZ
maximum output current	216A@400V a c
Total current	<3%
harmonic distortion rate	
power factor	>0.99/-1~1
Communication system	3W +N+PE
PV parameter	
Maximum PV voltage range	1000 Vdc
MPPT, and the operating voltage range	250~850V
MPPT full-load voltage range	450V ~850 Vdc
Number of DC access roads	4
Battery parameters	
Operating voltage range	420~850V
maximum power	240KW
system parameter	
cooling-down method	air blast cooling
relative humidity	<95% (no condensation)
Maximum work altitude	5000m (> 3000m drop)
levels of protection	IP 20
show	touch screen
CI	RS485 / Etherne t /CAN
BMS insert	permit
ambient temperature	-30°C~55°C
size	W 1200*D 800*H2050mm
weight	1120Kg
product certification	TUV /CE

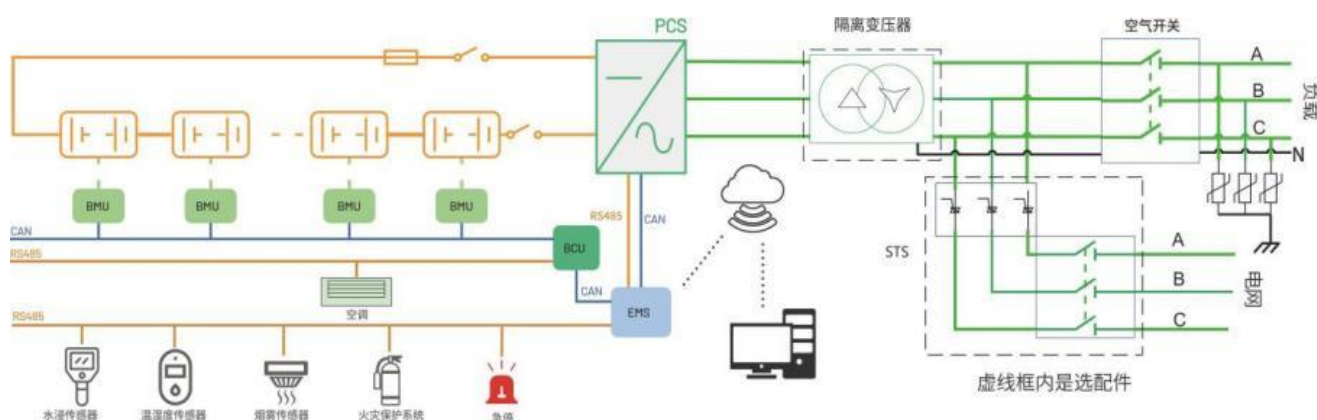
6. Energy storage monitoring platform system

Energy storage system monitoring platform system is divided into local monitoring platform and cloud monitoring platform, customers can be flexibly selected according to their needs. The energy storage system is equipped with an energy management

controller (EMS controller), which is connected to the energy storage system unit and the meter signal of the incoming cabinet. Automatic charge and discharge control according to the SOC status of the energy storage battery, the power or current value of the meter, and avoid the countercurrent of electric energy to realize energy management. EMS energy management system can realize the integrated energy management of lithium battery energy storage power station, and realize real-time monitoring, diagnosis and forecast

Alert, panoramic analysis, advanced control and other functions can meet the needs of comprehensive operation monitoring, intelligent security analysis and dynamic panoramic analysis

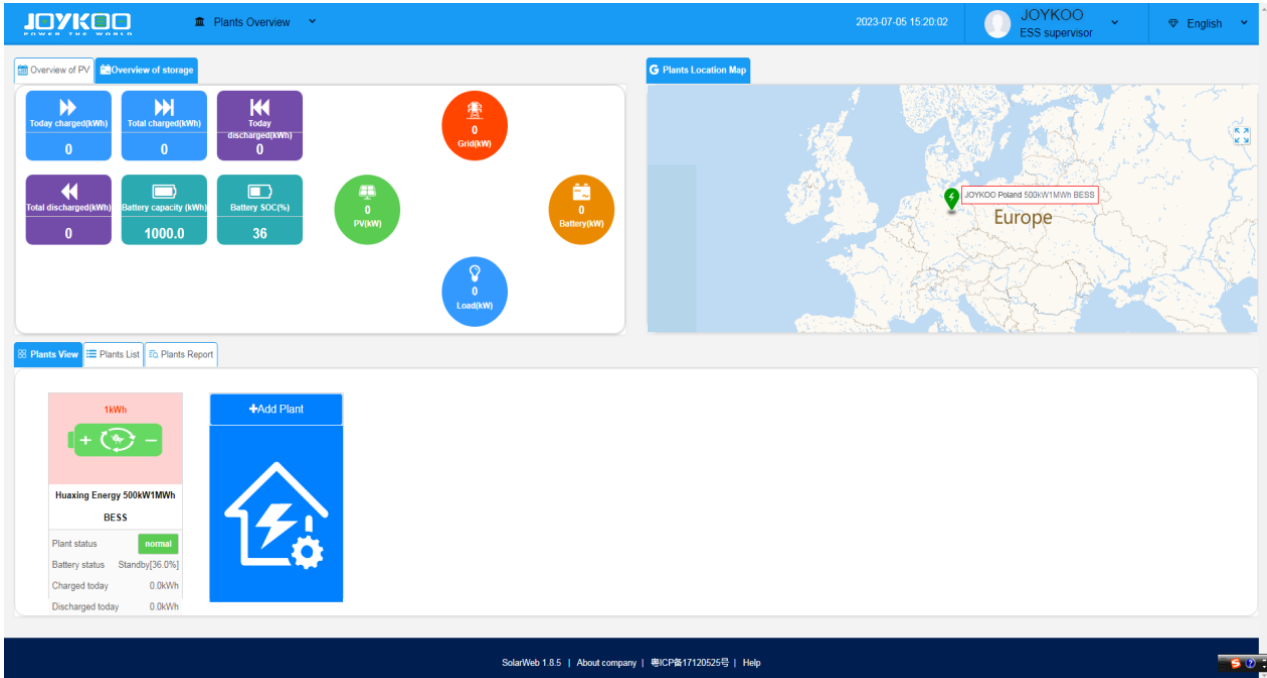
To ensure the safe, reliable and stable operation of the energy storage power station.



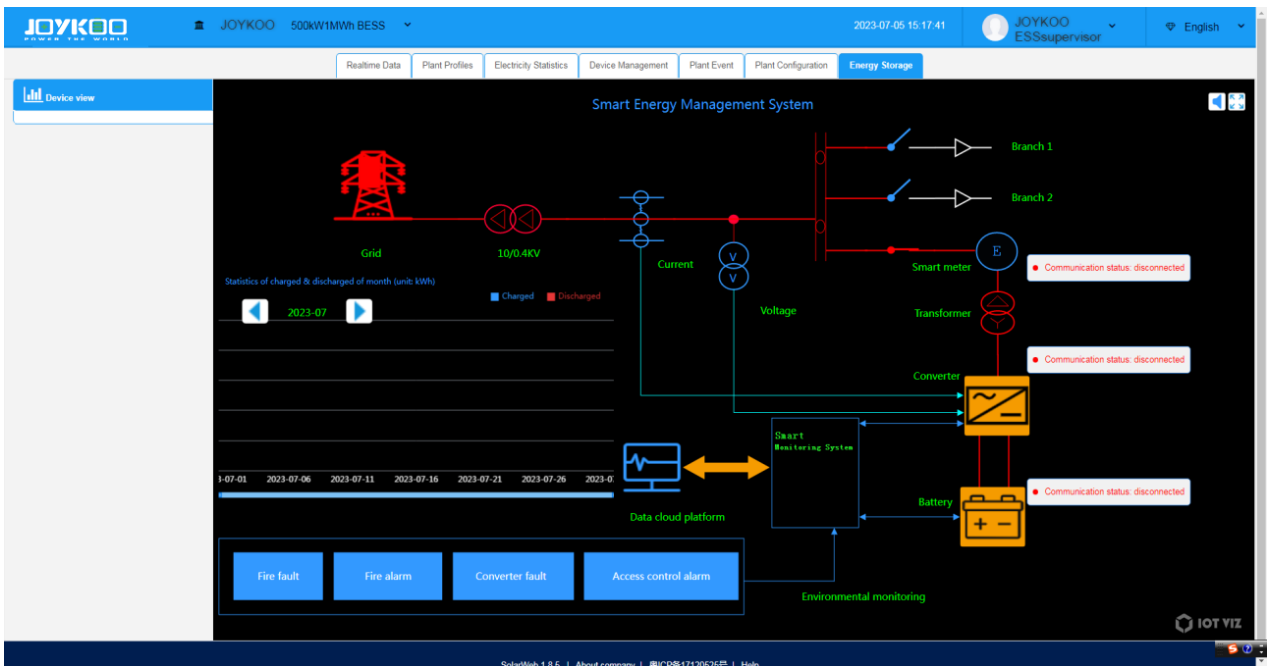
Typical system topology diagram

The main features of the energy storage monitoring platform are as follows:

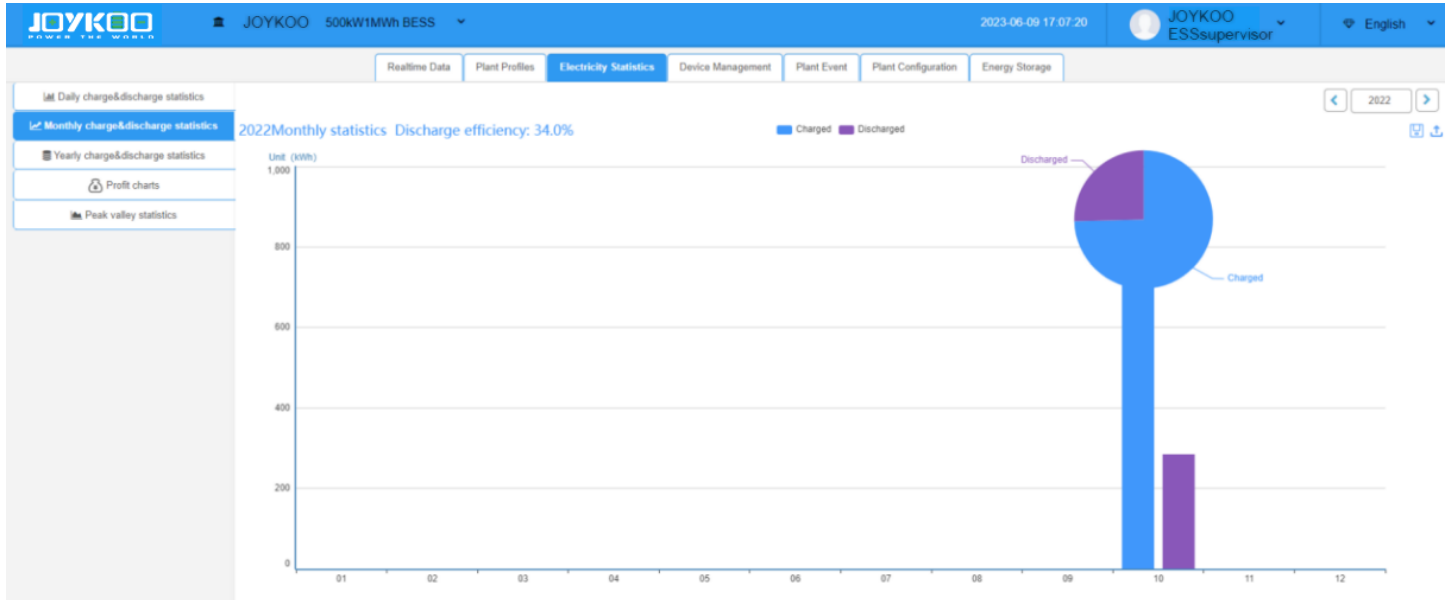
- B / S architecture, mobile phone, WEB public browsing, based on the micro-service framework, to achieve fast front-end data interaction, balance the front and rear-end data load;
- Powerful edge data processing capability: edge computing gateway supports local control policy distribution, embedded WEB, local real-time data display, historical data storage, power grid dispatching and docking, etc., even if the communication is disconnected, it can ensure the system operation according to the policy;
- Flexible system configuration: the edge gateway supports PCS, battery, electricity meter, inverter, box transformer, charging pile, power distribution cabinet, air conditioning, fire protection, oil machine, etc. through RS 485, Ethernet port, as long as the confirmed version agreement, there is no manufacturer and model restrictions;
- Perfect energy storage scheduling: with peak load shifting and valley filling, anti-counterflow control, network connection power factor control, multi-energy complementary control functions;
- Support IEC61850, IEC101 / IEC 104 and other professional power automation standard interfaces, convenient integration into the third-party platform;
- Configurable data visualization ability, not only support different projects and different styles of display, but also support the local touch screen simple visualization and monitoring center large screen viewing;
- Remote equipment debugging, log retrieval, upgrade software, to facilitate the whole life cycle maintenance of the power station;
- Support both Chinese and English languages, and other language versions need to be developed;
- Advanced database snapshot technology, including log management, data backup function, etc., to achieve catastrophic data recovery.



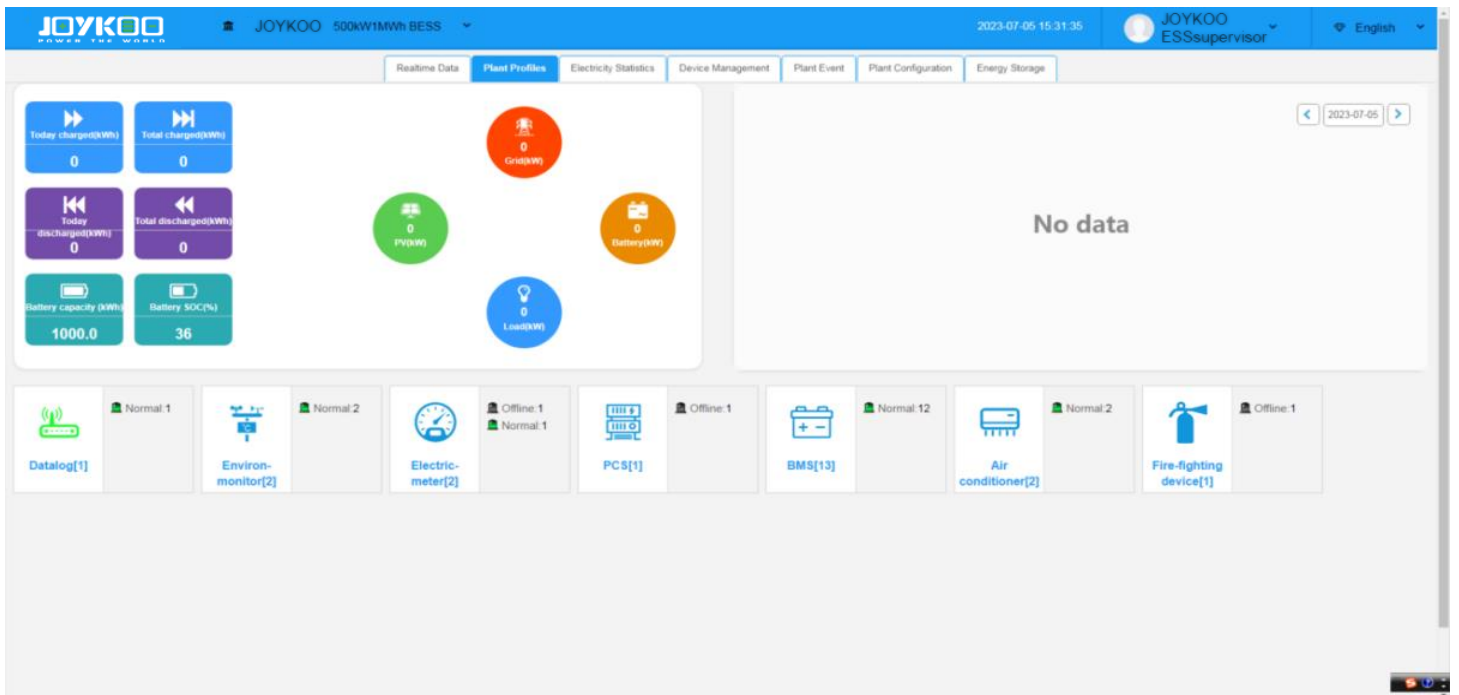
Operating interface for practical application cases



Distribution schematic diagram



Charge and discharge data



7. Main equipment list

name	parameter	quantity	unit
The 215kWh custom cabinet and its components		1	set
Energy storage battery pack (including BMS)	768V280Ah	1	cover
Fire extinguisher system	Aerosol/ perfluorohexanoneis optional	1	cover
Thermal management system	5kW Industrial air conditioning	1	set
Intelligent management system EMS	Energy storage system control and management	1	cover
Energy storage converter	100kW	1	set