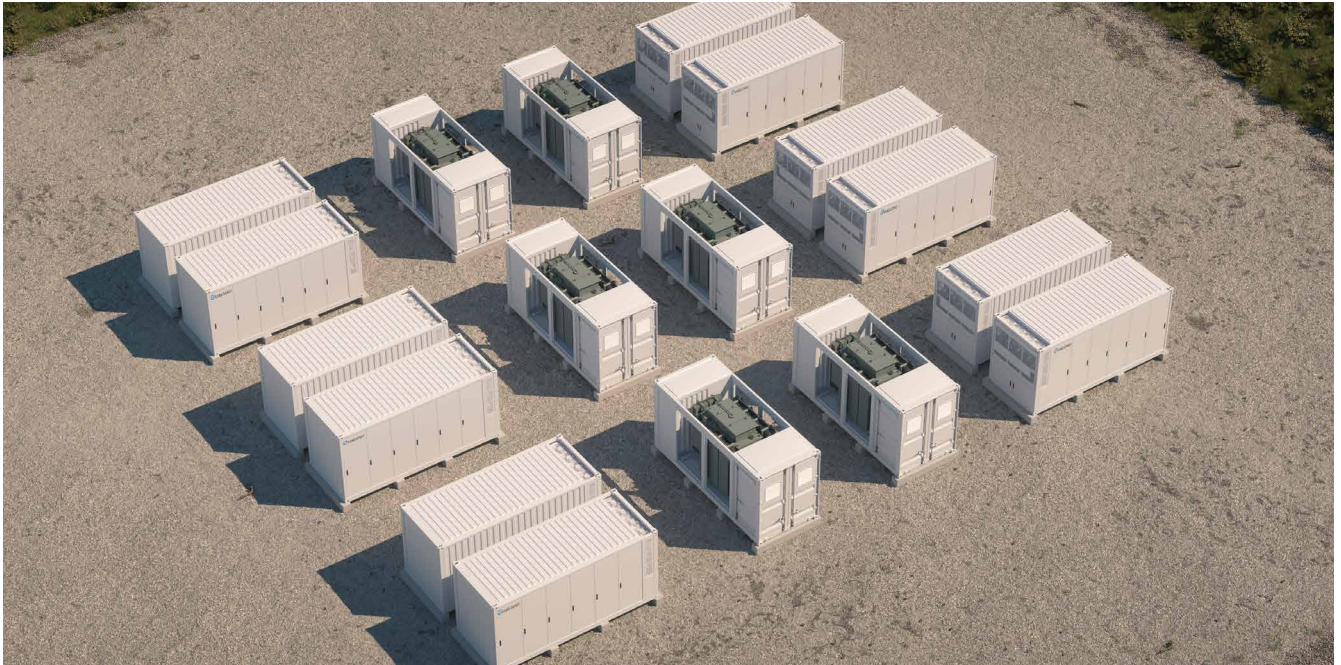


PowerCombo-20C2H2500K

Resilient, Reliable, and Quick Delivery Liquid Cooling Energy Station

PowerCombo-20C2H2500K(AC Block)



PowerCombo, a high-performance, all-in-one, containerized battery energy storage system developed by Cubenergy, provides users with the intelligent and reliable solution to optimize energy efficiency and resilience. As the leading BESS product, PowerCombo is certificated by UL1973, UL9540A, UL9540, IEC62619, CE, UN38.3, complied with IEC62933, IEC63056, NFPA855, provides secure, reliable and safe power supply.

PowerCombo-20C2H2500K, with capacity of 2500kW/5,015kWh@20ft, is ideal for mostly utility applications, such as renewable energy arbitrage and stand alone grid stabilization. The integrated and easy-to-install BESS can be easily connected and matched with the equipment, while the advanced PCS and cloud-based operation platforms bring superior interaction experience for users.

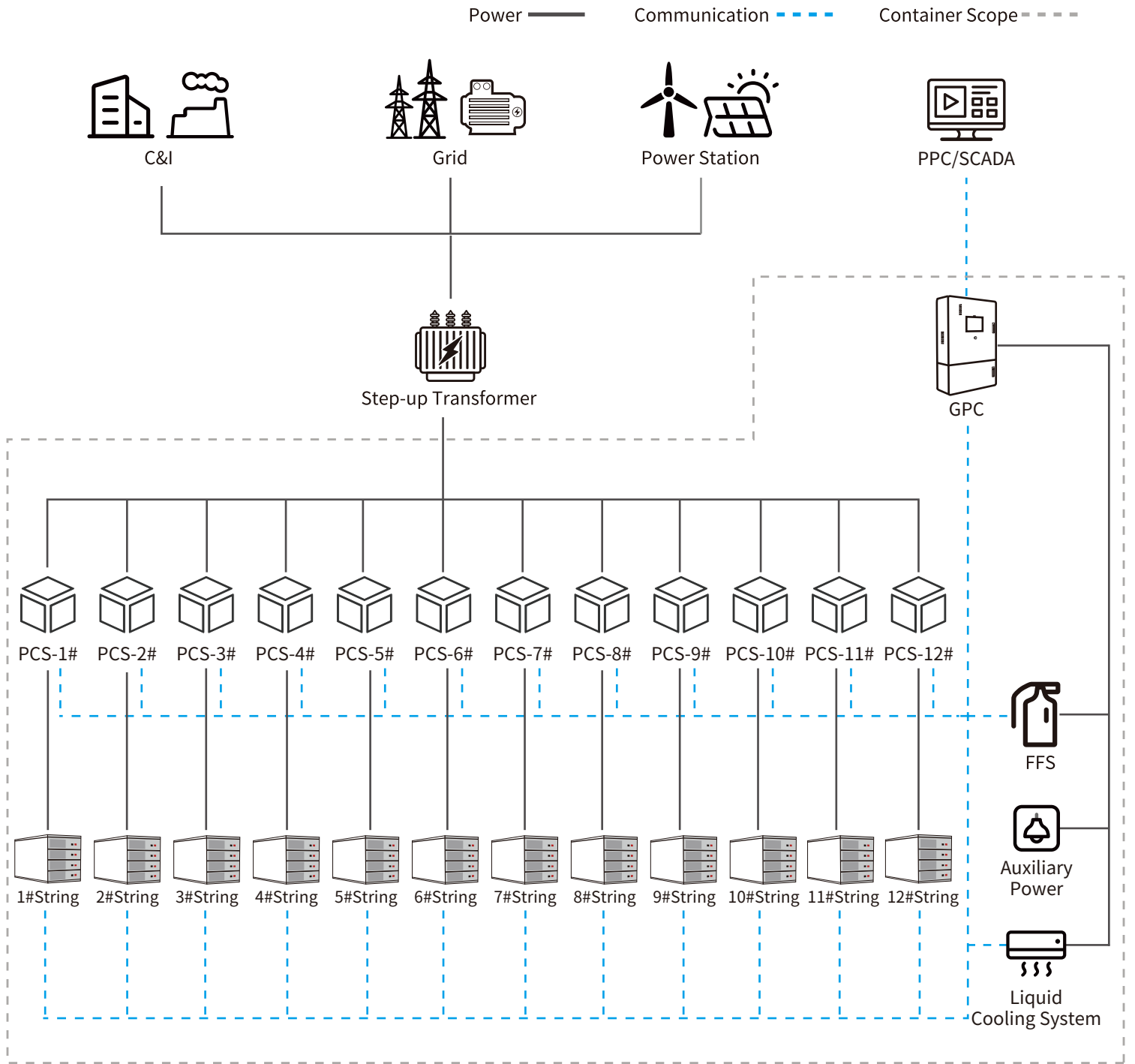


Application

- Smooth,time-shifting renewable energy export.
- Dynamic grid support (voltage & frequency regulation).
- Peak shaving and demand management.
- Microgrid stabilization with fast response.
- Utility-scale grid-forming ability.



System Topology



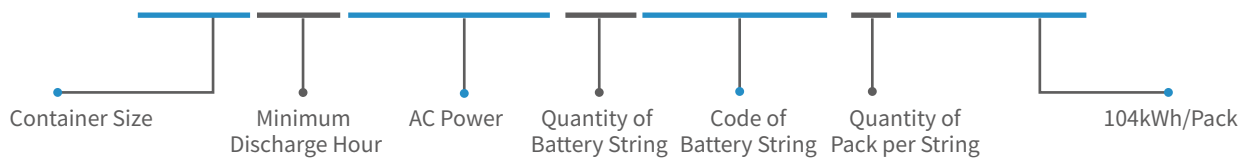
More Energy	AC Block	Plug&Play	Safe & Reliable
Pack-level Optimization String-level Optimization	AC/DC All-in-one Simple Layout, High Density	Perfect integration Quick Commissioning	Fire Code Compliance Multi-level prevention

□ Product Layout



□ Product Model Definition

20C2H2500K-12LS417-4LP104



□ Product Configuration

Product Model	Battery String Type	String Qty	Nominal Power	Nominal Capacity	DC Voltage Range	Grid-connected	Dimensions (WDH mm)
20C2H2500K	LS417	12	2,580kW	5,015kWh	1,164.8V~1,476.8V	690V	6,058x2,438x2,896mm

□ System Technical Specifications

Item	20C2H2500K
DC Data	
Battery chemistry	Lithium Iron Phosphate (LFP)
Cell life cycle	8,000 cycles with 70% retention @ 0.5C 25°C
Cell spec	3.2V/314Ah
String configuration	1P416S
Number of strings	12
DC rated energy capacity	5,015kWh
Rated voltage	1,331.2V
Voltage range	1,164.8V~1,476.8V
BMS communication interface	Ethernet
BMS communication protocol	CAN_BUS
AC Data	
Rated AC Power	2580kW (1290kW for 4hrs Application)
Maximum AC power	2,838kW
Rated voltage	690V
Grid voltage range	-15%~+10% (Adjustable)
AC rate of current	2,158A
Output THDi	1.5% (@100% Output)
AC PF	-1~+1
AC output	3W+PE
General Data	
Dimension w/o clearances (L*W*H)	6,058x2,438x2,896mm
Weight of the whole system	≤42.3t
Degree of protection	IP54
Operating temperature range	-30~50°C
Relative humidity	0~95% (non-condensing)
Working altitude	2,000m/6,562 feet (non-derating)
Cooling concept of Battery System	Liquid Cooling for Battery Pack
Fire fighting system	Safety Extinguishing Agent(PFAS Free Aerosol), UL/CE Listed Fire Control Panel, Pre-install fire sprinkler
Communication protocol	MODBUS TCP/IP
Certificates and Compliance	UL9540, IEC62933, UN3536, CE MARK by TÜV Rheinland

□ Key Components



- 0.5C Charge/Discharge;
- High Density and Safety Stack Design;
- Easy configuration and maintenance.

Battery String

Item	2LS417
Battery module configuration	1P416SX2P
Pack QTY	8
Rated capacity	835kWh
Rated voltage	1331.2V
DC voltage range	1164.8~1476.8V
Pack Configuration	332.8V/314Ah@1P104S
Communication	Ethernet, CAN, RS485
Dimensions (W*D*H)	926*2,260*2,250mm
Weight	5,229kg
Certifications	UL9540A, IEC62619, UN38.3

Power Conversion System



- Single-stage three-level modularization;
- High-efficiency liquid cooling;
- Long lifespan, low failure rate.

Item	CBAC-430-HA-M
Rated AC power	430kW
Max.DC current	480A
DC voltage range	1000~1500Vd.c
Power factor range	-1~+1
Degree of protection	IP66
Rated(MAX)AC current	360A (390A)
Rated AC voltage	690V (3W+PE)
AC voltage range	-15%~+10% (Adjustable)
Rated AC frequency	50/60Hz
Operating temperature range	-40~+60°C
Operating altitude	5000m (Derating above 3000 m)
Cooling method	Intelligent liquid cooling

□ Next-Gen Control



GridPoint Controller (GPC)
an advanced one-stop BESS control and status information and management center.

Power interface AC220V/DC24V	Communication Modbus TCP
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SPAC BMS

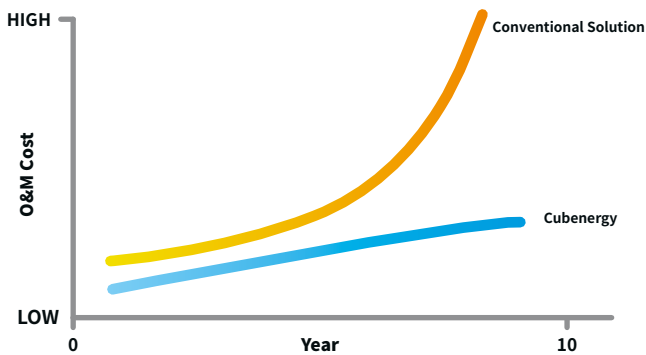
Cubenergy's controlling evolution since 2016

SPAC BMS delivers intelligent battery management through real-time cell voltage balancing. This proprietary technology minimizes energy loss caused by cell imbalances, increasing balance efficiency and extending battery cycle life. By ensuring uniform charge/discharge distribution across all cells, SPAC BMS maximizes usable capacity while maintaining stringent safety protocols—critical for large-scale BESS applications requiring long-term reliability.

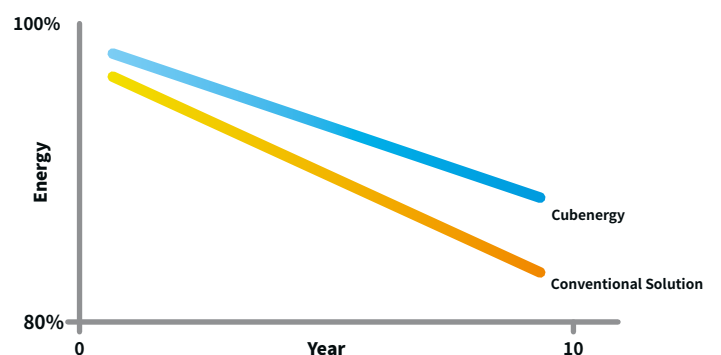
Functions

1. Monitor and protect safety of battery cell
2. Monitor and protect safety of electric system
3. Calculate and manage charging and discharging status
4. Calibrate and manage available energy
5. Optimize balance and manage cell consistency

Advantages



Maintenance Cost



Performance

□ Grid Forming*

Cubenergy's BESS is equipped with advanced technologies for grid voltage support and frequency regulation. It employs Virtual Synchronous Generator (VSG) control to emulate the external characteristics of synchronous generators. This delivers essential inertia, damping, and dynamic grid support, ensuring robust and stable power system operation.



Superior Grid Compliance



Maximized ROI



Enhanced Grid Resilience

Functions

● Inertia and Damping Control

Inertia Emulation: The inverter simulates inertia using a virtual inertia time constant, allowing it to release or absorb energy during grid frequency or voltage changes, helping to slow down system fluctuations.

Damping Control: A virtual damping factor is applied to suppress oscillations and improve the dynamic stability of the grid.

● Autonomous Frequency/Voltage Regulation

Frequency Control: Dynamically adjusts active power based on frequency deviation (parameter kf: 0-200).

Voltage Control: Dynamically regulates reactive power based on voltage deviation (parameter kv: 0-100).

● Multi-Scenario Adaptability

Islanded Operation: Maintains voltage/frequency independently during grid outages for critical load supply.

Weak Grid Support: Stabilizes voltage/frequency in high-renewable penetration scenarios.

Renewables Coordination: Optimizes operation with wind/PV through power sharing.

Advantages



● Enhanced Grid Stability

Compensates for the lack of inertia in renewable energy sources (PV/wind), mitigates intermittent power fluctuations from PV/wind generation, improves grid absorption capacity and suppresses frequency deviations.



● Flexible Operation Capability

Supports both grid-connected and islanded modes, maintaining voltage/frequency in microgrids, and participates in grid frequency/voltage regulation in grid-tied application.



● Multi-unit Cooperative Control

Enables precise power allocation among parallel inverters via virtual impedance and adaptive algorithms, solving uneven power distribution issues in traditional droop control.



● Power Quality Optimization

Reduces current THD (Total Harmonic Distortion) to solve voltage imbalance issues caused by PV inverter grid integration.

*Seamless PQ Mode (Fixed Power Output) and GFM Mode (VSG Mode) Switching for Multi-Scenario Operation.

NOTES

Product dimensions and physical appearance in this brochure are nominal and are provided for the convenience of our customers. Cubenergy reserves the right to make changes from time to time, without prior notification, which may change the dimensions and physical appearance shown.

We therefore recommend you to consult with a Cubenergy sales representative before your purchase.

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