

UTILITY-SCALE BATTERY ENERGY STORAGE

PowerCombo E5

Power for the age
of intelligence.

A complete AC block for resilient, intelligent energy infrastructure.



5,015 kWh

DC RATED CAPACITY

2,580 kW

RATED AC POWER

20 ft

INTEGRATED AC BLOCK

THE NEW INFRASTRUCTURE OF ENERGY

Power for the age of intelligence.

Blue Sphere builds the utility-scale battery platforms powering data centres, cities and grids through the AI revolution.



Every breakthrough of the next decade is constrained by one thing:
energy at scale, on demand.

A complete AC block, engineered as one system.

Battery strings, power conversion, liquid cooling, controls and fire protection are integrated within a compact 20-foot enclosure.



5,015 kWh

NOMINAL CAPACITY

2,580 kW

NOMINAL POWER

690 V

GRID-CONNECTED VOLTAGE

The resilient, reliable, quick-delivery liquid-cooling energy station is designed for utility applications including renewable-energy time shifting and stand-alone grid stabilisation. Advanced PCS and cloud-based operation platforms support commissioning, interaction and long-term operation.

2.5 MW-CLASS SYSTEM / 2,580 kW RATED AC POWER / 5,015 kWh / 20 ft

CERTIFIED

UL1973 / UL9540A / UL9540 / IEC62619 / CE / UN38.3

Compliant with IEC62933, IEC63056 and NFPA855.



Built for the realities of modern grids.

Fast, coordinated energy storage for the points where reliability, flexibility and scale matter most.

01 Renewable time-shifting

Smooth renewable-energy export and move stored energy to higher-value periods.

02 Dynamic grid support

Support voltage and frequency regulation through fast, coordinated response.

03 Peak management

Reduce peak demand and support energy-cost and capacity-management strategies.

04 Microgrid stabilisation

Respond quickly to changes in load and generation in islanded or weak-grid systems.

05 Grid-forming operation

Provide utility-scale grid-forming capability for resilient system operation.



Six power channels. One intelligent AC block.

Power conversion, battery strings, controls, fire protection and liquid cooling are coordinated inside one 20-foot enclosure.

12

BATTERY STRINGS

6

PCS CHANNELS

1

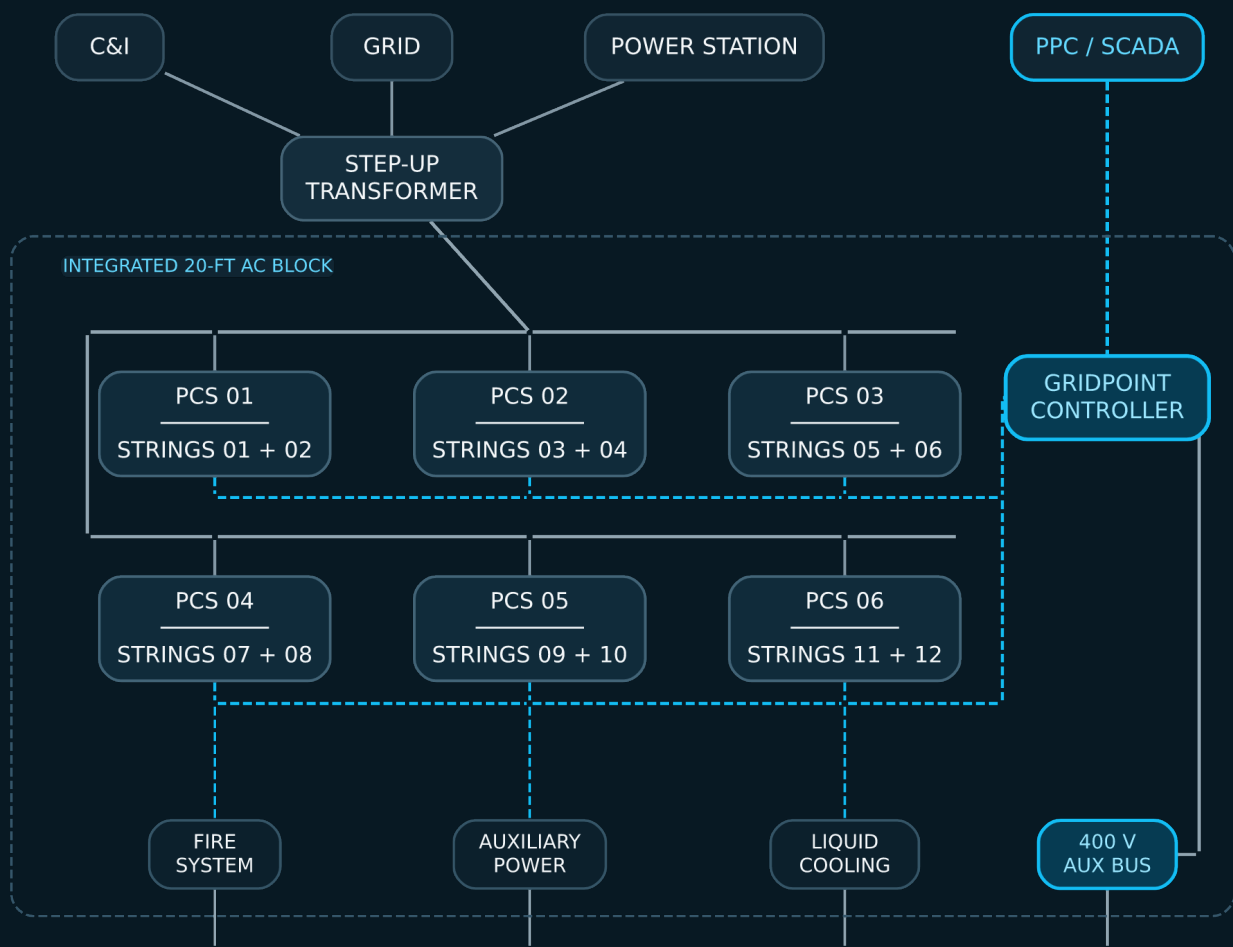
GRIDPOINT CONTROLLER

20 ft

INTEGRATED AC BLOCK

INTEGRATED SYSTEM ARCHITECTURE

POWER / CONTROL / SAFETY / THERMAL



ONE CONTROL LAYER. SIX PCS CHANNELS. TWELVE BATTERY STRINGS.



Five megawatt-hours in a 20-foot AC block.

A compact, high-density configuration designed for straightforward project integration.

12

BATTERY STRINGS

LS417

BATTERY STRING TYPE

≤44 t

WHOLE-SYSTEM WEIGHT

PRODUCT CONFIGURATION

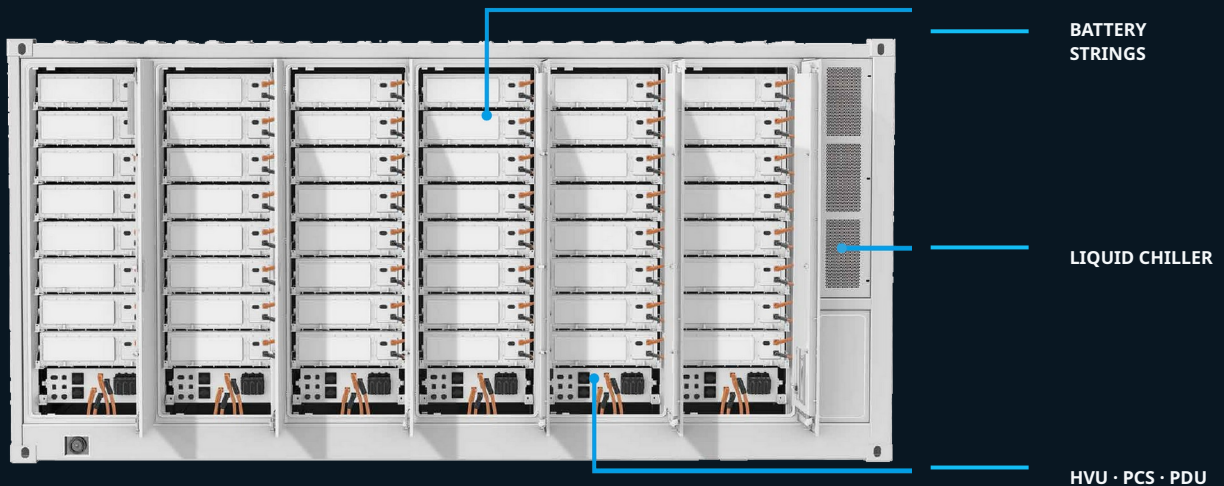
Product model	PowerCombo E5
Battery string type	LS417
String quantity	12
Nominal power	2,580 kW
Nominal capacity	5,015 kWh
DC voltage range	1,164.8 V ~ 1,476.8 V
PCS grid-connected voltage	690 V
Dimensions (W x D x H)	6,058 x 2,438 x 2,896 mm



Integrated subsystems. Clear service access.

The product layout is preserved from the source engineering document and presented at a larger, clearer scale.

INTEGRATED AC BLOCK



PLATFORM ADVANTAGES

01

More energy

Pack-level
optimisation
String-level
optimisation

02

AC block

AC/DC all-in-one
Simple layout, high
density

03

Plug & Play

Perfect integration
Quick
commissioning

04

Safe & reliable

Fire-code compliance
Multi-level
prevention

High-density. Serviceable. Protected.

A modular LFP string architecture configured for 0.5C charge and discharge.

LS417 / 1P416S × 2P



DESIGN NOTES

0.5C charge / discharge

High-density and safety-stack design

Easy configuration and maintenance

BATTERY STRING / LS417 × 2

Battery module configuration	1P416S x 2P
Pack quantity	8
Rated capacity	417.5 kWh x 2
Rated voltage	1,331.2 V
DC voltage range	1,164.8 ~ 1,476.8 V
Pack configuration	332.8 V / 314 Ah @ 1P104S
Communication	Ethernet, CAN, RS485
Dimensions (W x D x H)	926 x 2,260 x 2,250 mm
Weight	5,229 kg
Certifications	UL9540A, IEC62619, UN38.3

Modular, liquid-cooled power conversion.

Single-stage, three-level modularisation supports conversion efficiency, durability and serviceability.

CBAC-430-HA-M



430 kW

RATED AC POWER

DESIGN NOTES

Single-stage three-level modularisation

High-efficiency liquid cooling

Long lifespan and low failure rate

GRID CODE COMPLIANCE

EN50549-1/-2/-10
VDE 4110/4120/4130
TF3.3.1 Rev5 · SJV 2024
E10-16 · NTS 2.1 · G99

POWER CONVERSION SYSTEM

Item	CBAC-430-HA-M
DC voltage range	1,000 ~ 1,500 V
Maximum DC current	480 A
Rated AC power	430 kW
Rated AC voltage	690 V, 3W+PE
Grid-connected voltage range	586.5 ~ 759 V (Adjustable)
Rated (max.) AC current	360 A (396 A)
Grid frequency	50 Hz / 60 Hz
AC PF	-1 ~ +1
Degree of protection	IP66

DC and AC performance

Core electrical ratings retained exactly from the source technical specification.

DC DATA

Battery chemistry	Lithium Iron Phosphate (LFP)
Cell life cycle	8,000 cycles with 70% retention @ 0.5C, 25°C
Cell specification	3.2 V / 314 Ah
Each string configuration	1P416S
Number of strings	12
DC rated energy capacity	5,015 kWh
Rated voltage	1,331.2 V
Voltage range	1,164.8 V ~ 1,476.8 V

AC DATA / STANDARD OUTPUT

Rated AC power	2,580 kW
Maximum AC power	2,838 kW
Rated voltage	690 V
Grid-connected voltage range	586.5 ~ 759 V (Adjustable)
Rated AC current	2,158 A
Output THDi	<3% (Rated full load)
AC PF	-1 ~ +1
AC output	3W+PE

Built for demanding environments

Mechanical, environmental, cooling, fire-protection and interface data.

IP54

SYSTEM PROTECTION

-30 ~ 50°C

OPERATING RANGE

<2,000 m

NON-DERATING ALTITUDE

GENERAL DATA

Dimensions without clearances (L x W x H)

6,058 x 2,438 x 2,896 mm

Weight of the whole system

≤44 t

Degree of protection

IP54

Operating temperature range

-30 ~ 50°C

Relative humidity

0 ~ 95% (non-condensing)

Working altitude

<2,000 m / 6,562 ft (non-derating)

Temperature control method

Liquid cooling for battery pack and PCS

Fire-protection system

PFAS-free aerosol; UL/CE listed fire-control panel; pre-installed sprinkler

Peak auxiliary load

63 kW, 400 V 3P4W, 50/60 Hz

Communication interfaces / protocol

Ethernet / Modbus TCP/IP

Certificates and compliance

UL9540, IEC62933, UN3536, CE Mark by TÜV Rheinland

Intelligence from cell to plant.

Plant-level control and real-time cell-voltage balancing coordinate safe, efficient operation.

GRIDPOINT CONTROLLER



A one-stop BESS control,
status-information and
management centre.

POWER INTERFACE

AC220V / DC24V

COMMUNICATION

Modbus TCP

SPAC BMS

SPAC BMS TECHNOLOGY EVOLUTION SINCE 2016 / OEM SOURCE

Real-time cell-voltage balancing reduces energy loss caused by cell imbalances, improves balance efficiency, extends battery cycle life and maximises usable capacity while maintaining stringent safety protocols.

- | | | | |
|----|--|----|---------------------------------------|
| 01 | Monitor and protect battery-cell safety | 04 | Calibrate and manage available energy |
| 02 | Monitor and protect electrical-system safety | 05 | Optimise balance and cell consistency |
| 03 | Calculate and manage charge / discharge status | | |

INDICATIVE OEM COMPARISON / LOWER O&M COST + STRONGER 10-YEAR PERFORMANCE



We don't just store energy. We help hold the grid together.

Virtual Synchronous Generator control delivers inertia, damping and dynamic support for resilient system operation.

VSG CONTROL

The system emulates the external characteristics of synchronous generators to support voltage, frequency and dynamic stability.

Superior

GRID COMPLIANCE

Maximised

ROI

Enhanced

GRID RESILIENCE

01 Inertia + damping

Virtual inertia releases or absorbs energy during frequency or voltage changes. Virtual damping suppresses oscillations and improves dynamic stability.

02 Autonomous regulation

Active power responds to frequency deviation (kf: 0–200). Reactive power responds to voltage deviation (kv: 0–100).

03 Multi-scenario adaptability

Supports islanded operation, weak-grid stabilisation and coordinated wind/PV operation through power sharing.

Seamless PQ mode and GFM mode switching supports multi-scenario operation.

Resilience is a system property.

Grid-forming functions translate into four practical advantages for high-renewables and mission-critical networks.



01

Enhanced grid stability

Compensates for the lack of inertia in renewable sources, mitigates intermittent PV and wind fluctuations, improves grid absorption capacity and suppresses frequency deviations.

02

Flexible operation

Supports grid-connected and islanded modes, maintains voltage and frequency in microgrids, and participates in grid frequency and voltage regulation.

03

Multi-unit cooperative control

Enables precise power allocation among parallel inverters through virtual impedance and adaptive algorithms, addressing uneven power distribution.

04

Power-quality optimisation

Reduces current total harmonic distortion and helps address voltage imbalance created by photovoltaic inverter integration.



BLUE SPHERE
ENERGY SOLUTIONS

THE INFRASTRUCTURE POWERING THE AI REVOLUTION.

One platform. A planetary grid.

Start a conversation about resilient, scalable energy infrastructure.

WEB www.bluesphereenergysolutions.com

EMAIL hello@bluesphereenergysolutions.com

PHONE [+44 333 577 2219](tel:+443335772219)

ADDRESS 3rd Floor, 207 Regent Street, London, W1B 3HH

Product dimensions and physical appearance are nominal and provided for customer convenience. Specifications may change without prior notice. Consult Blue Sphere Energy Solutions before purchase.