Shinson®

Technology Beyond Limits

megacube™

AC Coupled BESS

MEGACUBE 1000kW

BATTERY ENERGY STORAGE SYSTEMS

www.shinsontech.com

MEGACUBE 1000kW
BATTERY ENERGY STORAGE SYSTEMS

2064kWh

Product Description

MEGACUBE 1000kW Battery Energy Storage Systems have been created to be an install ready and cost effective on-grid, hybrid, off-grid commercial/ industrial battery energy storage system.

Multiple applications

Applications of the MEGACUBE include micro-grid, backup power, peak shaving, time of use bill management, frequency regulation, voltage support, renewable integration, and islanding.

Ready to fit anywhere

MEGACUBE 1000kW battery energy storage solution is the ideal fit for larger scale commercial applications.

Each commercial BESS is manufactured to be install ready.

The future of solar energy storage

Lithium Iron Phosphate (LiFePO4) battery systems connected at high voltage come with 5000 cycle warranty and up to 80% DOD (Depth of Discharge) @ 0.5C 25C

'20 foot container

Large Scale Li-Ion Battery ESS (LFP) - About

MEGACUBE 1MW Battery Energy Storage System 's (AC Coupled) are an essential component and a critical supporting technology for smart grid and renewable energy (wind and solar). The MEG-1000 provides the ancillary service at the front-of-the-meter such as renewable energy moving average, frequency regulation, backup, black start and demand response. MEG-1000's enhance the flexibility, economy, and safety of traditional power systems and significantly improve renewable energy access

All system systems are offered in either 400VAC or 480VAC 3 phase.

BESS Benefits

- Pre-Installed System from Factory
- AC Coupled
- Simplified Installation
- Demand Response
- Energy Independence (w/PV)
- Peak Load Shifting

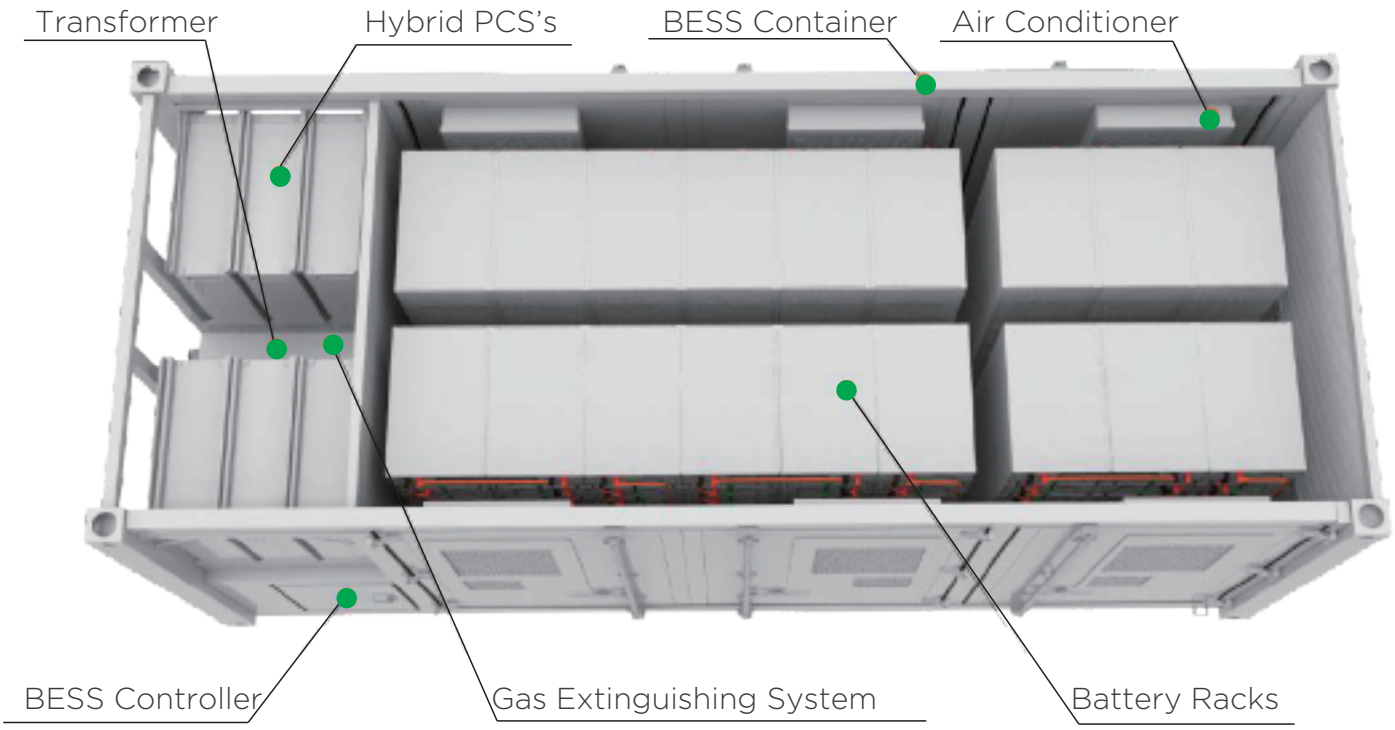
Common Applications

- New Energy Peak shaving
- Frequency Regulation
- Ancillary Services
- Energy Shifting
- Spinning Reserve
- Voltage and Reactive Power Support
- Transmission and Distribution Support

MEGACUBE 1000kW Battery Energy Storage Systems

Item	1MW/2.0MWh
DC Data	
Battery chemistry	Lithium Iron Phosphate (LFP)
Cell life cycle	80% Retention with 5,000 Cycles @ 0.5C 25℃
Cell spec	3.2V/280Ah
String configuration	1P384S
Number of strings	6
Rated energy capacity	2MWh
DC rated energy capacity	2,064.36kWh
Rated voltage	1,228.8V
Voltage range	1,075.2V~1,363.2V
BMS communication interface	RS485, Ethernet
BMS communication protocol	Modbus RTU, Modbus TCP
AC Data	
Rated AC power	1,000kW
Maximum AC power	1,320kW
Rated voltage	690V
Grid voltage range	586.5~759V(Optional)
AC rate of current	836.8A
Output THDi	< 3%
AC PF	0.1~1 leading or lagging (Controllable)
Isolation method	Three-phase and three-wire
General Data	
Dimension w/o clearances (L*W*H)	6,058x2,438x2,591mm
Weight of the whole system	24t
Degree of protection	IP65
Operating temperature range	-20~40℃
Relative humidity	0~95% (non-condensing)
Max working altitude	4,000m/13,123ft
Cooling concept of DC hatch	HVAC
Communication interfaces	RS485, Ethernet, GPRS
Certifications	UL9540，IEC62619, IEC62109, IEC62933, UN3536, etc

MEGACUBE 1000kW Battery Energy Storage Systems



BESS's Include:

- Battery Racks & Wiring (LFP)
- 3 level BMS and Local Controller, PLC System
- High Voltage Units (BMS)
- 1MW Power Conversion System (PCS) (DC/AC)
- 1MW Transformer
- 800kW STS (excludes N/A systems)
- 20 GP Container
- HVAC System
- Fire Suppression System (FFS NOVEC 1230)
- Installation Manuals, Certificates, Usage Guide, etc.

MEGACUBE 1000kW Battery Energy Storage Systems

Item	Data
Battery module configuration	1P16S
Pack QTY per rack	24
Nominal rack capacity	344kWh
Discharge cutoff ~ rated voltage ~ charge cutoff voltage	1075.2 ~ 1228.8 ~ 1363.2
Pack	3.2V/280Ah@1P16S
Rated voltage	280Ah
BMU Qty	24
String voltage sampling period	100ms
String measuring current range	+-350A
String current detection accuracy	≤1%
SOC calculation accuracy	≤7%
Input insulation resistance	≥10MΩ 1,500V DC
Communication	Modubus TCP, CAN, Modubus RTU
System cycle life	≥5,000 cycles @ 1C, 25C
Weight	2880kg
Certifications	UL1973, UL9540A, IEC62619, CE , UN38.3

Battery String-S344

- 0.5C Charge/Discharge
- The energy supply can be a single battery string or parallel battery strings
- Easy configuration and maintenance

Item	Data
DC voltage range	1,000-1,500Vdc
DC voltage max	1500Vdc
Maximum DC current	224.5A
Maximum PV current	384A
Rated output power	200kW
Rated grid voltage	690Vac, 3W+PE
Grid voltage range	586.5-759V (settable)
The frequency range of the power grid	50/60Hz
AC Max current	184.1A
Cooling	Temperature controlled forced air cooling
Max efficiency	99%
AC PF	-1~+1
Communication interface	RS485/CAN/Ethernet
Weight	100kg

Power Conversion System

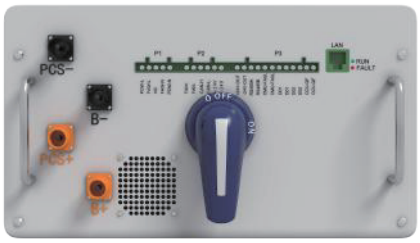
- Three-level topology, up to 99% conversion efficiency, better power quality
- Integrated cluster-level battery management function, high battery availability
- Intelligent multi-stage fan speed regulation, wide temperature operation capacity, 50 °C no derating
- Supports constant power, constant current, constant voltage control, with a frequency modulation, VSG, black start and other functions
- Supports IEC61850 protocol, with MS-level responsiveness
- IP66 protection

MEGACUBE 1000kW Battery Energy Storage Systems

Battery Pack-P14

TCP / RS485 | TCP / RS485 | Life span >5,000 cycles @ 0.5C/25C

Item	Data
Capacity (kWh)	14.336kWh
Rated voltage	51.2V
Discharge cut-off voltage	44.8V
Charge cut-off voltage	56.8V
Cycle life	+5,000 cycles @ 0.5C 25C
Voltage detection accuracy of battery cell	310 mV
Temperature detection accuracy of battery cell	±2℃
Balancing current of battery cell	≥150mA
Range of voltage measurement for battery cell	1-5 V
Battery balancing method	Passive balancing
Certifications	UL1973, IEC62619, UN38.3



M215-HVU

Multistage protection | Rich interface | Dual-channel power supply

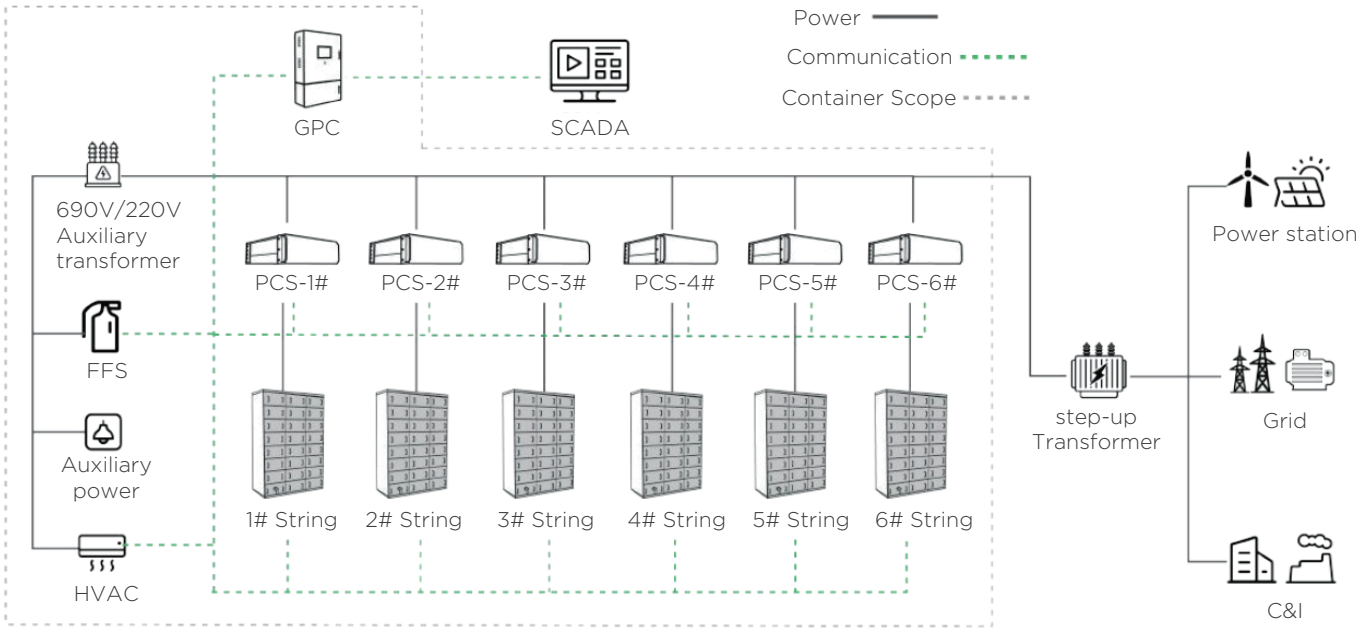
Item	Data
Circuit breaker	250A
Hall sensor	300A
Leakage current sensor	50mA
Fuse	250A
Error range of voltage detection accuracy	+-1%
Error range of Current detection accuracy	+-1%
Temperature detection accuracy	±2℃
Operating life	10 years
Certifications	UL1973

BESS Controller

Pre-enginered control strategy | Easy configuration | Cloud base date communication

Item	Data
Dimension (L*W*H)	480 x 230 x 770mm
Relay	4 dry contacts inputs / outputs
Power interface	AC 220V，50/60Hz
PCS communication	TCP/RS485
HVU communication	TCP/IP
HVAC communication	RS485
Grid control application	Time shifting, peak shaving, renewables moving average
Off-grid control application	Backup power, PV/DG/EV/ESS integrated micro-grid control
Battery management system	DC busbar incoming control

MEGACUBE 1000kW Battery Energy Storage Systems



Energy Storage System Safety Assurance

- The container used in the MEG 1000 has a flame-retardant insulation, which blocks the heat exchange between the inside and outside environment and reduces the air conditioner's load/ boosting the cooling efficiency. Fire retardant insulation prevents any internal fire from spreading in and around the container area.

- The MEG 1000 is equipped with a precision air conditioning system that automatically adjusts the battery compartment temperature to 26C, creating an ideal operating environment for lithium iron phosphate batteries.

- The MEG 1000 has a complete battery management system (BMS), which has functions such as:
  - high-precision analog signals detection and reporting
  - fault alarm, uploading and storage
  - battery protection
  - parameters setting
  - passive balancing
  - battery SOC calibration and information interaction with other devices

  The BMS can detect the temperature inside battery cabinets so when the battery's temperature exceeds the set temp threshold, the system automatically disconnects the battery pack, suspends charging or discharging, and reports the fault to the management platform.

- The MEG 1000 is engineered with an GPC safety protection strategy based on protective relays. The GPC collects battery string operation data, PCS operation signals, and fire-fighting and environmental control system signals, and communicates them with the energy management system (EMS), power conversion system (PCS), battery management system (BMS), environmental control system (ES), and fire-fighting system (FS). The collection and communication enable the GPC to intervene and control the DC busbar connection, container internal environmental control, PCS charging/discharging, and faulty battery pack disconnection, thus effectively protecting the system against the charging/discharging overload; thus greatly improving the safety and reliability of the system.

- The MEG 1000 is equipped with a fire fighting system which are placed in every battery pack unit, high-voltage drawer unit, control cabinet, and low-voltage cabinet. The aerosol is stored in a solid form, and it is not volatile, so there will be no leakage problems.

BESS System Monitoring

A cloud based energy management system (EMS) monitors the loads at the PV power station, grid access point, and at the energy storage systems grid access point in real-time.
By monitoring real-time data, and taking safety & stability constraints into consideration, the cloud based EMS can dynamically adjust the energy storage system's charge/discharge strategies.

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