

# FlexCombo-M250 Microgrid System

Resilient, Reliable, and Quick Delivery Energy Station

# Introduction



Shenzhen Cubenergy Co., Ltd. (hereinafter referred to as "Cubenergy") is a young while leading manufacturer of C&I scale stationary Battery Energy Storage System (BESS). It is an innovative energy solution provider, integrating BESS with Grid, PV system, Diesel Generator with self-developed BMS and cloud-based EMS, WeWatt™, forming a series of standardized, all-in-one, EPC-free microgrid ESS.

Headquartered in Shenzhen, China, Cubenergy was established in Oct. 2015. Cubenergy built up its BESS factory in Dongguan, Guangdong, with the annual production capacity of over 2GWh, 2 R&D centers in Chengdu and Shenzhen, 7 sales offices globally.

Cubenergy has been developing quickly, till end of 2021, accumulatively, the company has manufactured 620MWh BESS and battery strings. Internationally, Cubenergy FlexCombo DC coupling microgrid ESS, from 50kW to 500kW, is a well-known trademark that more than 300 sets has been deployed in US, Canada, Brazil, Myanmar, African countries etc. only in 2021.

Cubenergy follows very high standards in manufacturing its products. The battery pack, string and ESS are certified by TUV to align with IEC/UL standards of UL9540A, UL1973, IEC62619 etc.

The future of energy is distributed, clean, and consumer-centric. Cubenergy makes the future of energy resilient.

# FlexCombo-M250 Microgrid System



## Advanced & Guaranteed System

- Strong R&D team supports innovative products and continuous improvement thereafter;
- Self-developed BESS controller and EMS, ensuring best reliability of the system;
- High-standard testing process guaranteeing quality delivery;

## Reliable & Competitive Quality

- UL9540A compliant up to battery string level, 1 out of 7 manufacturers in China;
- Containerized with protection level at IP54 for the whole system and IP65 for the battery compartment;

## Money-saved & Versatile Application

- 6,000 cycles battery cell against market prevailing 3,000 cycles battery cell;
- DC coupling system ensuring: higher DC/AC ratio, higher round trip efficiency;
- Accessible to different sources of powers: PV, Grid or DG, supports both on-grid and off-grid modes;

## Smart & Easy Operation

- Fully integrated and plug-and-play microgrid system;
- 7\*24 cloud-based monitoring and operation platform supports the visit of Mysql database and multiple mobile/PC devices.



Safe and Reliable

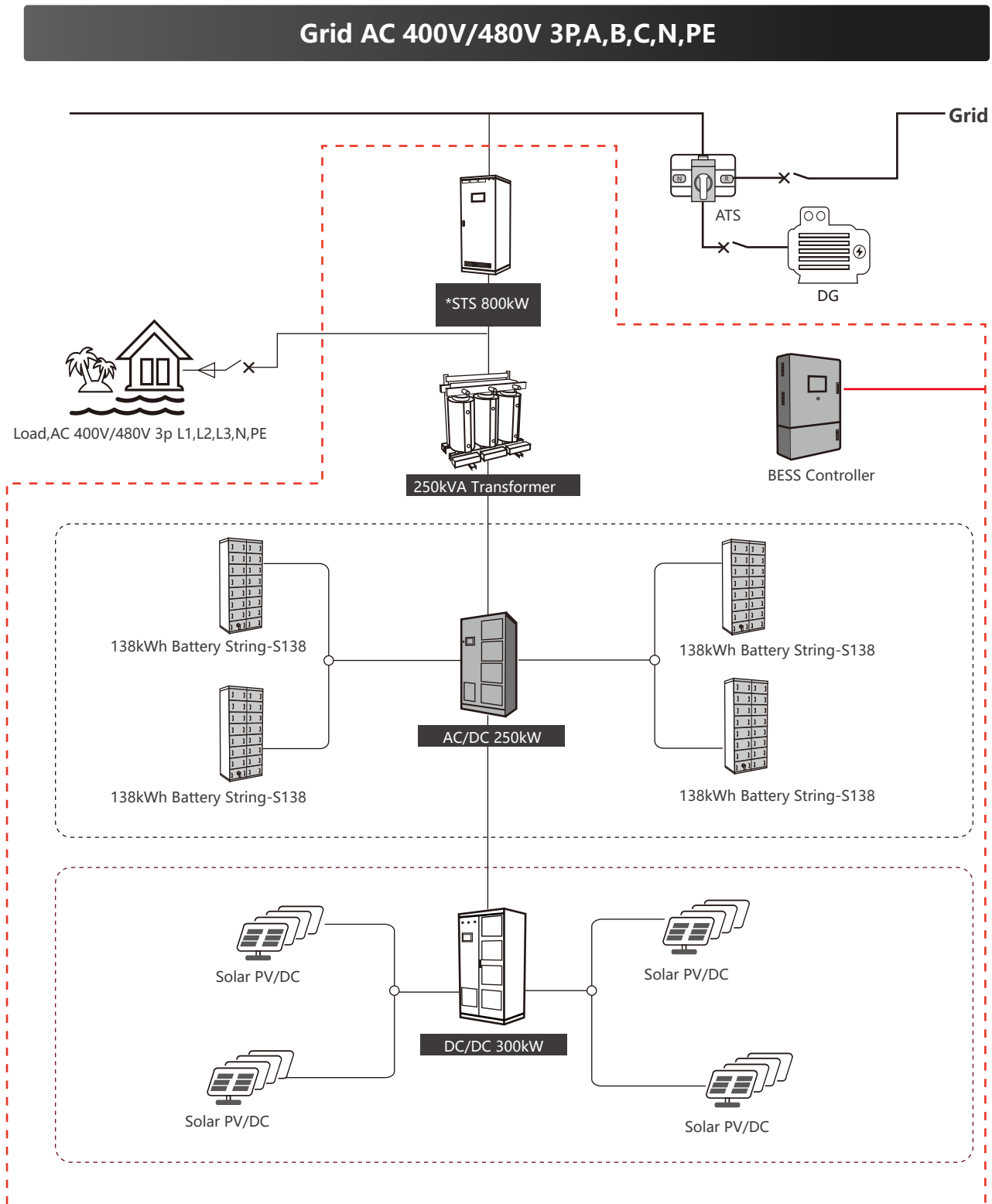


Long Life Span



Smart and Friendly

# System Topology (PV+250kW PCS+276/552/1,104/1,656kWh BESS)



\*STS module is applied worldwide, except for North American region.

# System Configuration



## Product features (250kW/1,104kWh)

- The 250kW PCS cabinet contains a 250kW PCS with 500-850V DC voltage;
- The n\*138kWh(n=2/4/8/12) battery strings are converted to 400V/480V AC through the modularized PCS, AC power is transferred to the isolated transformer supporting the load;
- The battery string is charged from the corresponding PV string and 300kW DC/DC during day time operation;
- When BAT and PV supplies are insufficient, ATS switches the power supply to DG or grid. STS performs on-grid and off-grid seamless switching to ensure continuous power supply of load;
- The EMS control system runs automatically without manual operation;

Product Model	S138 Strings	Container	STS(optional)	(DC/DC Convertor)	PCS	Transformer
	S138-15P9	Size	800kW	300kW	250kW	250kVA
M250-276	2	20ft	1	1	1	1
M250-552	4	20ft	1	1	1	1
M250-1,104	8	40ft	1	1	1	1
M250-1,656	12	40ft	1	1	1	1

# □ Key Components



## Battery String-S138

- 1C Charge/Discharge;
- The power supply can be a single battery string or parallel battery strings;
- Easy configuration and maintenance;

Item	Data
Battery module	S138-15P9
Pack QTY	15 (6~15 Configurable)
Nominal capacity	138kWh (55~138kWh)
Discharge cutoff- rated-charge cutoff voltage	672V~768V~852V
Pack	3.2V/90Ah@2P16S
String measuring voltage range	100~1,000V
String voltage detection accuracy	±1%
String voltage sampling period	100ms
String measuring current range	±300A
String current detection accuracy	≤1%
SOC calculation accuracy	≤7%
Input insulation resistance	≥10MΩ, 1,000V DC
Communication	ModbusTCP,CAN,ModbusRTU
System cycle life	≥5,000 cycles@1C, 25°C
Dimensions (W*D*H)	800*750*2,050mm
Weight	1,465kg
Certifications	UL1973, UL9540A, IEC62619, CE , UN38.3



## DC/DC Convertor

- Bi-direction DC-DC convertor;
- Field-replaceable modular design;
- Shared or separated DC bus;

Item	Data
PV input voltage	250~672Vdc
PV input current	0~120A*6, MPPT=6
PV string configuration	Vmp>250Vdc, Voc<672Vdc, Isc<120A
Max PV input power	330kWp, 55kWp*6
DC bus coupled voltage	672~850Vdc
DC bus coupled current	0~100A*6
Max DC output Power	300kW, 50kW*6
Dimension(W*D*H)	1,100*800*2,060mm
Weight	500kg



### Power Conversion System

- Single-stage three-level modularization;
- Multi-branch input to reduce battery series and parallels connection;

Item	M250-EX	M250-NA
Battery voltage range	500~850V	
DC max current	550A	
Rated AC power	250kW	
Maximum AC power	275kW	
Rated voltage	400V	480V
Grid voltage range	±15%	±10%
AC rate of current	360A	301A
Output THDi	≤3%	
Adjustable PF	1(leading)~1(lagging)	
Grid frequency range	50/60±2.5Hz	59.5~60.5Hz
Isolation method	3 Phase 4 Line Transformer	
Dimensions (W*D*H)	1,200*800*2,160mm	
Weight	1,280kg	

NA: For North America EX: For Europe and other country



### Static Transfer Switch

- Integrated distribution cabinet function, a variety of distributed power access;
- Millisecond on/off-grid switching;
- Automatic operation, unattended;
- It has a 15-inch display screen, which can monitor the operation of each equipment;

Item	Data
Rated power	800kW
Rated voltage	400V
Input voltage range	-25%~15%
Output voltage range	-25%~15%
Rated input current	1,155A
Max input current	1,270A (110%)
Frequency range	50/60±4.5Hz
Switching time	10ms~80ms
IP degree	IP20
Efficiency	99.5% (Full load)
The max load standing capacity during switching	300kW (RCD type, pure capacitive load or inductive load < 100kvar)
Wiring mode	3 Phase 4 Wire
Dimensions (W*D*H)	800*800*2,160mm
Weight	450kg

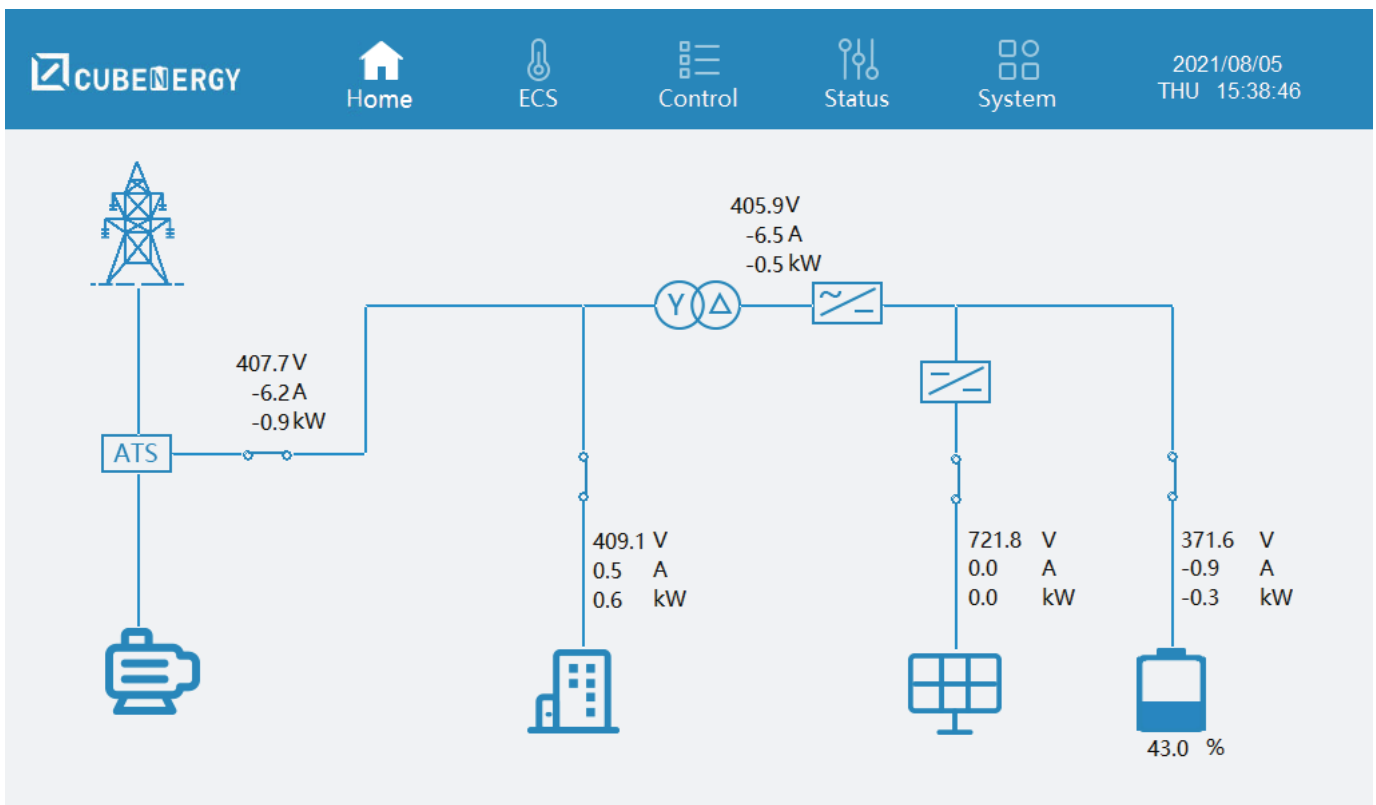


### BESS Controller

- Data acquisition;
- Multiple protection: overload protection & reverse power protection;
- Intelligent interaction HMI;

Item	Data
Dimensions (L*W*H)	600*700*2,200mm
Weight	200kg
Protection Level	IP20
Operating Temperature	0°C~40°C
Memery	dual-core micro-controller 64M RAM 128M flash memory
Network	Safety zones divided by network switches and firewalls.
Power Consumption	<100 W
Backup Time	30 minutes (optional)
HMI	15" LCD touch screen

## □ EMS



\*STS module is applied worldwide, except for North American region.



## System Technical Specifications

Item	M250-276	M250-552	M250-1,104	M250-1,656
<b>DC Data</b>				
Battery chemistry	Lithium Iron Phosphate (LFP)			
Cell life cycle	80% Retention with 5,000 Cycles @1C 25°C			
Cell spec	3.2V/90Ah			
String configuration	2P240S			
Number of strings	2	4	8	12
Rack rated energy capacity	138kWh			
DC rated energy capacity	276kWh	552kWh	1,104kWh	1,656kWh
Rated voltage	768V			
Voltage range	672V~852V			
BMS communication interface	RS485, Ethernet			
BMS communication protocol	Modbus RTU, Modbus TCP			
<b>AC Data</b>				
Rated AC power	250kW			
Maximum AC power	275kW			
Rated voltage	400V/480V			
Grid voltage range	±15%/±10%			
AC rate of current	360A/301A			
Output THDi	≤3%			
Adjustable PF	1(leading)~1(lagging)			
Grid frequency range	50/60±2.5Hz/59.5~60.5Hz			
Isolation method	3 Phase 4 Line Transformer			
<b>General Data</b>				
Dimension w/o clearances (L*W*H)	6,058*2,438*2,591mm		12,192*2,438*2,591mm	
Weight of the whole system	<12t	<15t	<21t	<26t
Degree of protection	IP54			
Operating temperature range	-20~40°C			
Relative humidity	0~95% (non-condensing)			
Max working altitude	3,000m/9,842ft			
Cooling concept of DC hatch	HVAC			
Communication interfaces	RS485, Ethernet, GPRS			
Certifications	UL1973, UL9540A, IEC62619, CE, UN38.3			

## NOTES

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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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