

## FSE Solutions Sales Map

### CHINA

Kunshan  
Xiamen  
Ningbo  
Huizhou  
Guangzhou  
Suzhou  
Jinjiang

### VIETNAM

Ha Tinh  
Renze

### TAIWAN

Taipei  
Taoyuan  
Hsinchu  
Taichung  
Changhua  
Nantou  
Yunlin  
Tainan  
Kaohsiung

### JAPAN

Tokyo  
Kyoto

### USA

Texas  
Louisiana

### INDONESIA

### PHILIPPINES



台塑新智能科技股份有限公司  
FORMOSA SMART ENERGY TECH CORP.

#### HEADQUARTERS

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#### R & D CENTER

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New Taipei City, Taiwan  
Tel +886-2-2299-3318 Fax +886-2-2299-3567

#### MODULE PLANT

No. 359, Sec 3, Zhongshan Rd., Changhua City,  
Changhua County, Taiwan  
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#### BATTERY CELL & MODULE PLANT

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Changhua County, Taiwan  
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# Formosa Smart Energy Solutions and Products

FORMOSA  
SMART  
ENERGY

Energy  
Conservation

Energy  
Storage

New  
Energy

Recycling



FORMOSA SMART ENERGY



Due to its climate-friendly nature, new energy generated from renewable natural resources such as wind and sunlight is considered the path towards a more sustainable future.

Renewable energy not only helps reduce our reliance on traditional energy generated from non-renewable resources such as coal, oil and natural gas, which leaves a significant negative impact on the environment, it also creates the opportunity for a new energy-economic development model to emerge.

Over **3,000**  
Client Applications

Over **25**  
Construction Sites  
Around the World

Over **15**  
Years of Experience

## PRODUCT OVERVIEW

LFP Battery Cell	3
LFP Battery Pack (Module)	5
Commercial & Industrial Energy Storage System	9
Residential Energy Storage System	13
EV Battery System	15
Tubular Photobioreactors	17

▶ Trustworthy ▶ Systematic ▶ Safe ▶ Intelligent



**2008**

Formosa Biomedical Technology Corp. (FBC) established "Formosa Lithium Iron Material Technology" to focus on the research, development, production and sales of lithium iron phosphate (LFP) cathode material.

**2010**

Established the "Formosa Biomedical Battery Team", actively develop and sell a variety of lithium iron phosphate battery products in the domestic market.

**2014**

Started exporting internationally to countries such as the United States, China, Vietnam, and the Philippines. Both local and foreign companies started adopting LFP batteries to replace their lead-acid batteries.

**2018**

Started pushing for the production of LFP batteries and modules to be 100% in-house and obtained certifications given out by third-party safety laboratories in compliance with UL, UL Japan, IEC, S-JET, and UN38.3 standards.

**2020**

Started getting into energy storage and installed a 1.5MW/1.5MWh ESS container in the Changhua Coastal Industrial Park for the "Forward-Looking Infrastructure Demonstration Program" led by ITRI.

**2022**

Formosa Smart Energy Tech Corp. (FSE) was established as a joint venture by Formosa Plastics, Nan Ya Plastics, Formosa Petrochemical, Formosa Chemicals & Fibre, and Formosa Biomedical. FSE has since built Taiwan's first 1.2MW/1.3MWh sReg energy storage project at the FBC Changhua Plant.

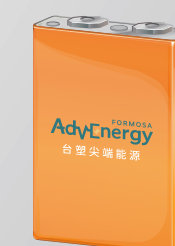
**2024**

FSE set up both a LFP battery module plant and a LFP battery cell plant (Formosa AdvEnergy) in Changhua Coastal Industrial Park with a total capacity of 2.1GWh.

The construction of phase 1 of both factories completed towards the end of the year and production has begun.

**2025~**

Formosa AdvEnergy's battery cells and modules are now steadily supplying the energy storage and EV markets, with Phase II expansion already underway.





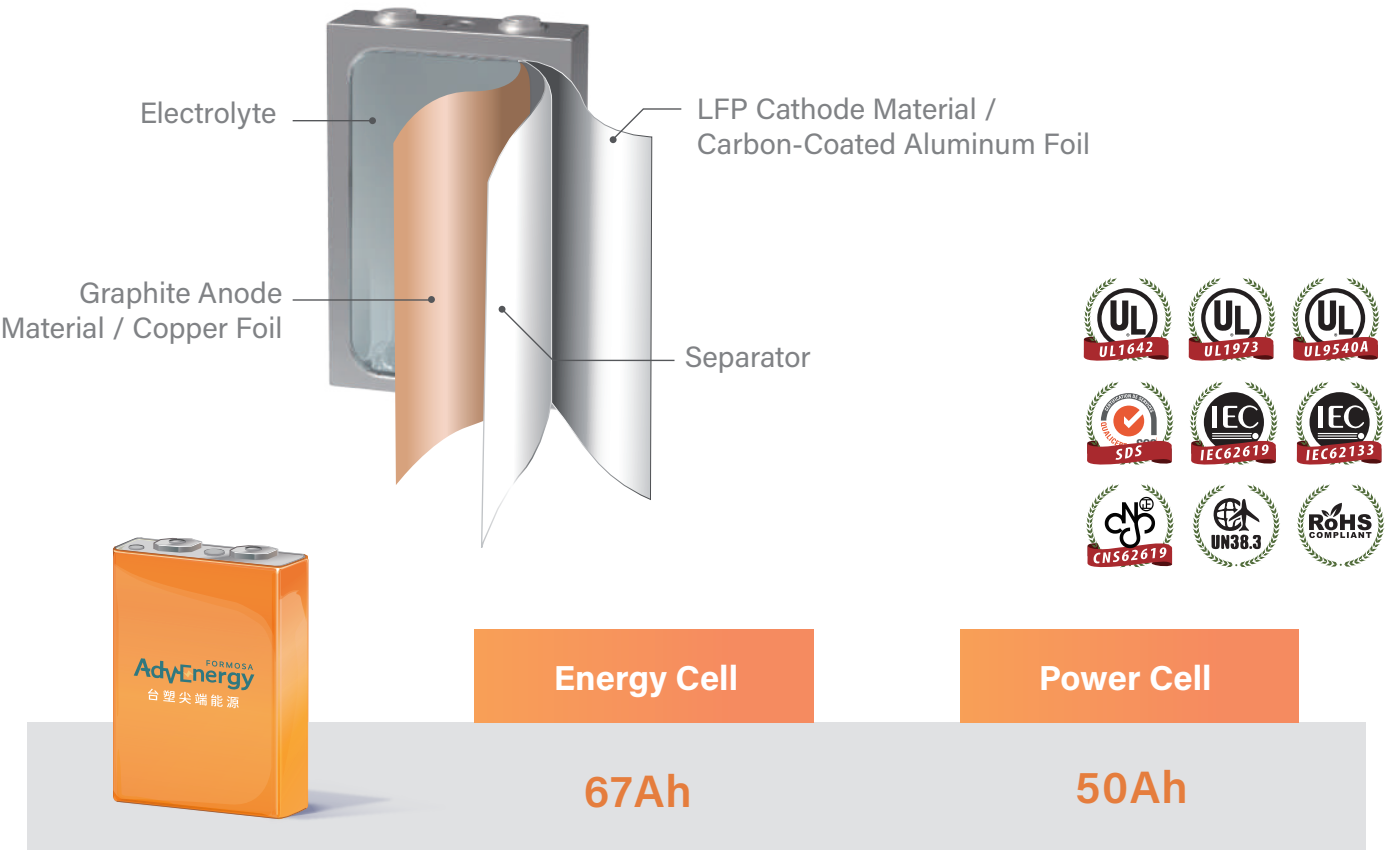
Taiwan's largest LFP Battery Plant

Backup supply systems and energy storage systems are becoming increasingly more mainstream when it comes to improving grid instability, increasing the power generation efficiency of traditional power plants, and speeding up the penetration rate of renewable energy.

At Formosa Smart Energy Tech Corporation (FSE), we take a bottom-up approach with the design of our energy storage systems. We have integrated our very own battery management system (BMS), the only BMS in Taiwan that has been extensively tested and certified. Our careful design paired with our BMS helps to ensure our ESS can be optimized for use in a wide-range of applications, creating more value for our customers.



LFP BATTERY CELL



APPLICATION	C&I, Residential ESS, EV	UPS, Electric Vehicle, High-power Supply
ENERGY DENSITY	175 Wh/kg	128Wh/kg
VOLUMETRIC ENERGY DENSITY	353 Wh/L	279 Wh/L
25°C CYCLE LIFE	≥4000	≥3000
45°C CYCLE LIFE	≥2000	≥1500
DIMENSION (INCLUDING OUTER FILM)	D43.2 * W100 * H141 mm	D43.2 * W100 * H141 mm
WEIGHT	1235±37g	1250g±37g

● Please refer to the product datasheet for more details.



# LFP BATTERY PACK



Item	24V UPS		48V UPS	12V DC Charger
Specification	24V50Ah	24V67Ah	96V50Ah	12V134Ah
Model	LFP-24V050AH-B	LFP-24V067AH-B	LFP-96V050AH-B	LFP-12V134AH-B
DC Voltage	25.6 V	25.6 V	96 V	12.8 V
Capacity	1.28 kWh	1.72 kWh	4.8 kWh	1.72 kWh
MAX Charging Current	100 A (2C)	67 A (1C)	100 A (2C)	110 A (0.8C)
MAX Discharging Current	325 A (6.5C)	110 A (1.6C)	400 A (8C)	130 A (0.97C)
Configuration	8S1P	8S1P	30S1P	4S2P
Dimension D*W*H	575*130*208 mm	575*130*208mm	846*280*200mm	351*221*184mm
Weight	17 kg	17 kg	64 kg	13.6 kg

• Please refer to the product datasheet for more details.

## LFP BATTERY PACK



48V ESS		
Specification	48V67Ah	48V134Ah
Model	LFP-48V067AH-A	LFP-48V134AH-A
DC Voltage	51.2 V	51.2 V
Capacity	3.43 kWh	6.86 kWh
MAX Charging Current	53.6 A (0.8C)	110 A (0.8C)
MAX Discharging Current	110 A (1.6C)	110 A (0.8C)
Configuration	16S1P	16S2P
Dimension D*W*H	612*221*184mm	950*235*181mm
Weight	30 kg	57 kg

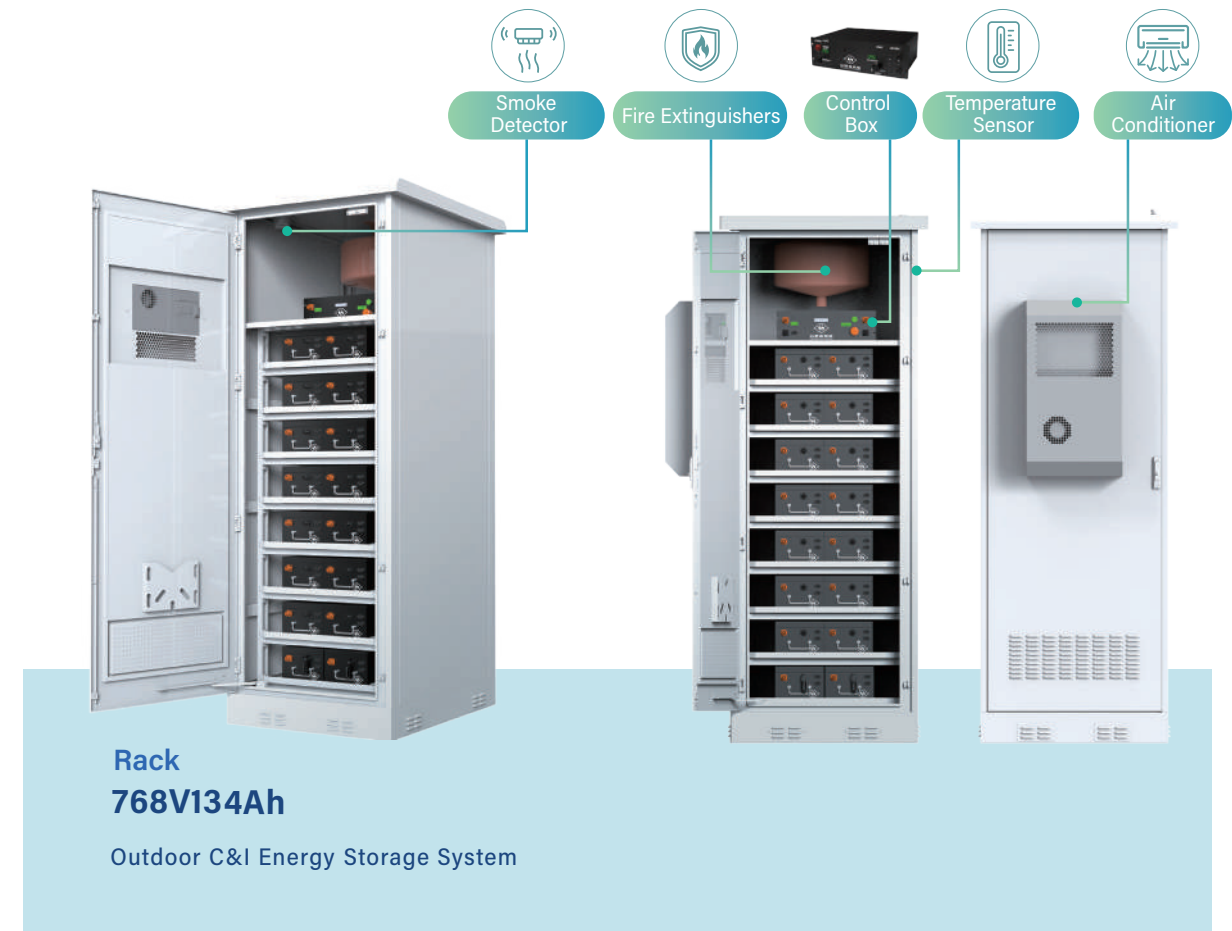
• Please refer to the product datasheet for more details.

### Transformations lasting over 15 years

In accordance with Formosa Plastics Group's collective working spirit of "creating a moral world through diligence, striving for excellence", all battery modules are subject to the same standardized assembly process, undergo at least two charge and discharge tests, and go through a battery cell matching procedure to ensure the customer is provided with a perfect battery system.







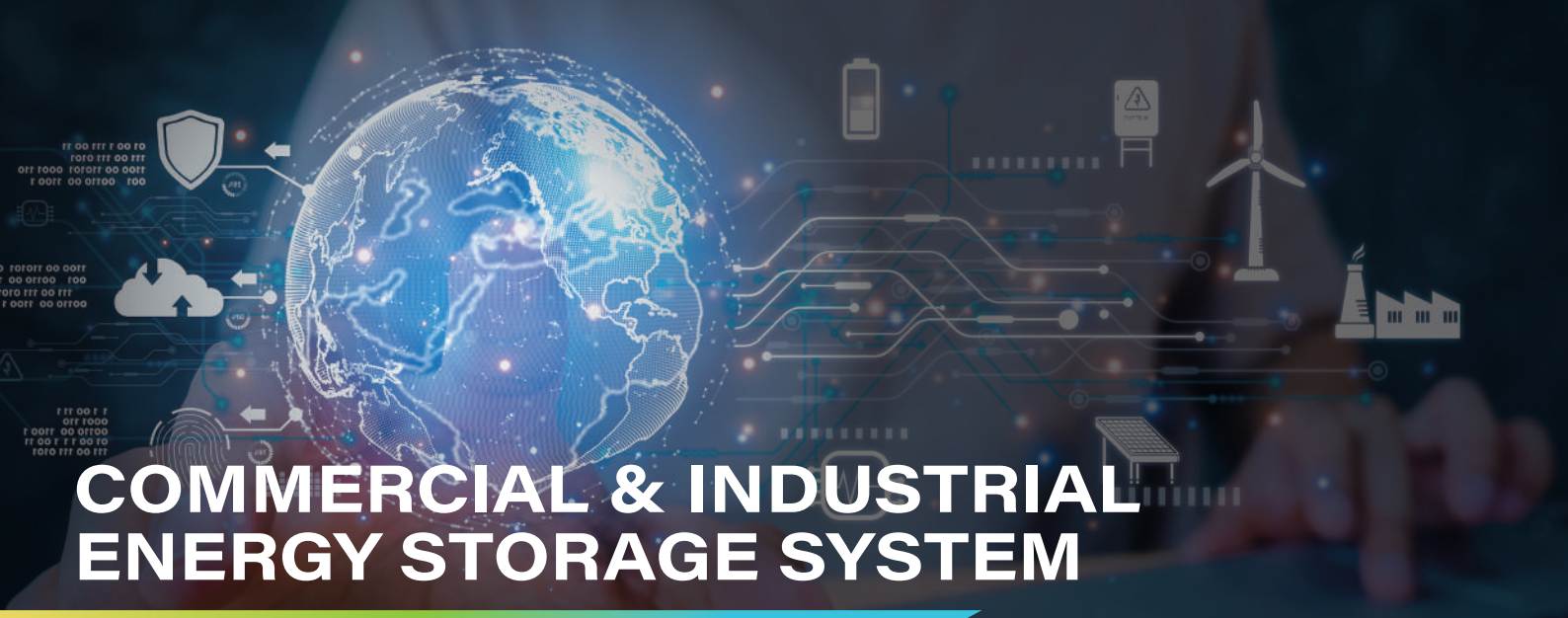
UPS				
Item	Factory Backup		Data Center	DC Charger
Specification	480V50Ah	480V67Ah	576V100Ah	108V134Ah
Model	US050-160IMS5	US067-160AMS1	HC480HU	DC134-036BPS1
DC Voltage	512 V	512 V	576 V	115.2 V
Capacity	25.6 kWh	34.3 kWh	57.6 kWh	15.4 kWh
MAX Charging Current	100 A (2C)	67 A (1C)	200 A (2C)	110 A (0.8C)
MAX Discharging Current	325 A (6.5C)	110 A (1.6C)	405 A (8C)	130 A (0.97C)
Configuration	20S1P	20S1P	6S2P	9S1P
Dimension D*W*H	800*600*2100mm	800*600*2100mm	946*667*2150mm	800*650*1600mm
Weight	563 kg	563 kg	1200 kg	278kg

• Please refer to the product datasheet for more details.



Outdoor ESS		
Specification	768V134Ah	1056V134Ah
Model	ES134-256CMF2α	ES134 -352GMF1
DC Voltage	819.2 V	1126.4 V
Capacity	109.77 kWh	150.93 kWh
MAX Charging Current	100 A (0.7C)	100 A (0.7C)
MAX Discharging Current	110 A (0.8C)	110 A (0.8C)
Configuration	16S1P	22S1P
Equipment	Air Conditioning System, Fire Fighting Equipment, Smoke Detector, Temperature Sensor	
Dimension D*W*H	1000*1250*2550mm	1000*1250*2550mm
Weight	1325 kg	1700 kg

• Please refer to the product datasheet for more details.



## CELL CONSISTENCY

### Battery Cell Balancing System

With our battery cell balancing system , subtle electrical differences introduced during the cell manufacturing process can be corrected, and the time decay exacerbated by DC internal resistance can be offset. Not only does our balancing system extend the safe operating lifespan of the battery system, it also helps expand the operational range and enhances the stability of the battery system.



Hierarchical BMS



Smart Balancing System



Redundant Subsystems



Double Protection

## BMS FEATURES

Our battery management system passes the IEC/UL60730-1 certification standard

Programmed with smart balancing algorithms and equipped with a two-stage isolation control system, redundant subsystems, a self-reset system, and a remote control system, our BMS allows for high-precision and contact-less ampere-hour measurement calculations.



## COMMERCIAL & INDUSTRIAL ENERGY STORAGE SYSTEM



Rack  
768V134Ah  
Standard



Rack  
1056V134Ah  
High Voltage



ESS			
Specification	768V67Ah	768V134Ah	1056V134Ah
Model	BR108-256AMF	ES134-256CMF2	ES134-352GMF1
DC Voltage	819.2 V	819.2 V	1126.4 V
Capacity	54.88 kWh	109.77 kWh	150.93 kWh
MAX Charging Current	67 A (1C)	100 A (0.7C)	100 A (0.7C)
MAX Discharging Current	110 A (1.6C)	110 A (0.8C)	110 A (0.8C)
Configuration	16S1P	16S1P	22S1P
Dimension D*W*H	667*545*2001mm	985*560*2001mm	985*560*2439mm
Weight	654kg	1150kg	1480kg

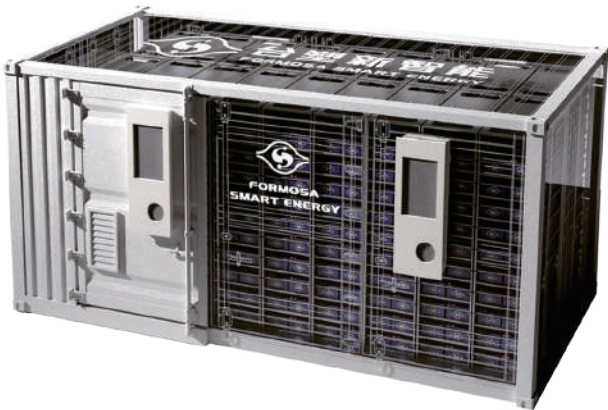
• Please refer to the product datasheet for more details.





# ENERGY STORAGE SYSTEM

## 20'CONTAINER TEU



Utilizes LFP batteries

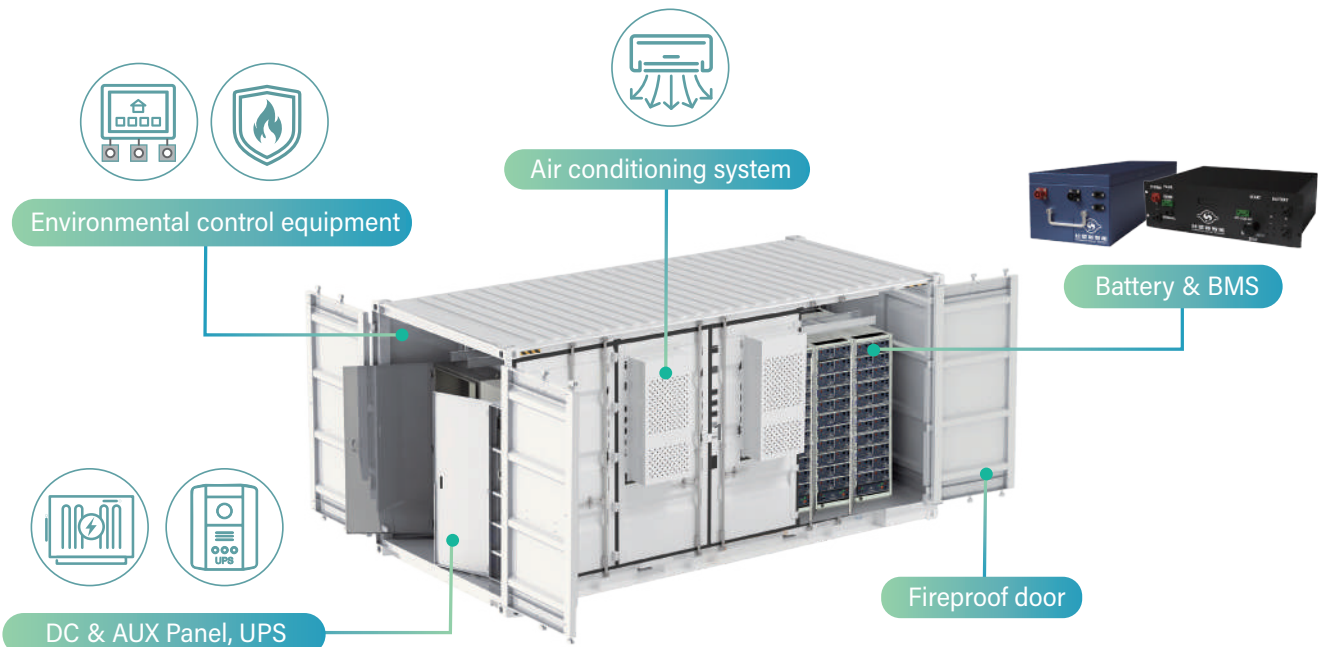


Ingress Protection rating : IP54



Corrosion Class: ISO 12944 C5

Complies with ISO 1496, TIR certification, International Convention for Safe Containers(CSC) and container standards, IEEE 693 HIGH LEVEL standards.



## ENERGY STORAGE SYSTEM

ESS			
Model	FESS 20-134A	FESS 20-134B	FESS 20-134C
DC Voltage	819.2 V	1126.4 V	1126.4 V
Capacity	1.97 MW	2.71 MW	3.01 MW
MAX Charging Current	100 A (0.7C)/Rack	100 A (0.7C)/Rack	100 A (0.7C)/Rack
MAX Discharging Current	110 A (0.8C)/Rack	110 A (0.8C)/Rack	110 A (0.8C)/Rack
Configuration	16S18P	22S18P	22S20P
Dimension D*W*H	6058*2438*2896mm	6058*2438*2896mm	6058*2438*2896mm
Weight	26.8 ton	33 ton	36 ton

### Equipment

- DC Busbar
- Temperature Sensors
- Residual Current Device
- HMI
- Gas Detectors
- Surge Arrester
- Air Cooling System
- UPS System
- Liquid Alarm Sensors
- Fire Protection System
- High-Voltage Fuse
- High Current DC Disconnecter
- Smoke Detectors

\*Based On The Actual Application Requirements Of The Project.

• Please refer to the product datasheet for more details.







## RESIDENTIAL ENERGY STORAGE SYSTEM

The image is for illustrative purposes only. Actual product may vary.

STANDARD  
MODULE

10-YEAR  
WARRANTY

OVER 3,600  
CYCLE LIFE

SMART  
BALANCING

AUTOMATIC  
POWER-OFF  
PROTECTION

FIREPROOF  
MATERIALS

SMART  
NEW CHOICE,  
LIGHTING UP  
MY HOME.



## RESIDENTIAL ESS



### Residential ESS

HB134-016EME1 HB268-016EME1

Nominal Capacity [Ah]	134	268
Nominal Voltage [V]	51.2	51.2
Energy [kWh]	6.86	13.72
Dimension [L*W*H, mm]	580*300*605	580*300*1055
Weight [kg]	77	143.5

Please refer to the product datasheet for more details.



### Hybrid PCS

FSE HESS 6KW

Power [kW]	6
Nominal Discharge Current [A]	25A
Nominal Discharge Voltage [Vac]	120/208/240
Nominal Discharge Voltage [Vac]	48
Maximum Charging Current [A]	120
IP Rating	IP65
Operating temperature range	-10~55°C
Dimension [L*W*H, mm]	700*515*215.5
Weight [kg]	41

Can be used as  
an emergency power supply

Can be paired with  
a photovoltaic (PV) system

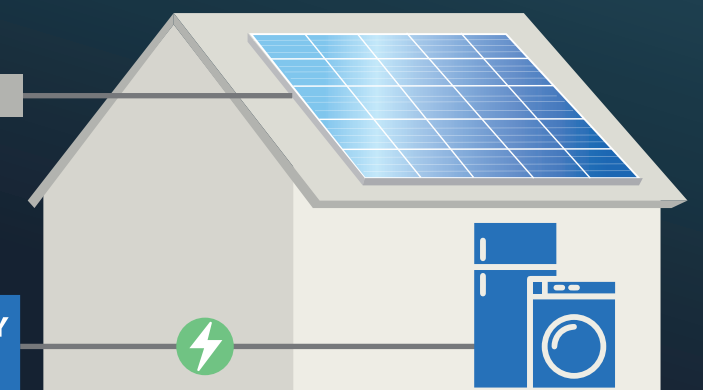
Can be stacked to increase  
energy storage capacity

Can be used strategically to  
decrease electricity costs

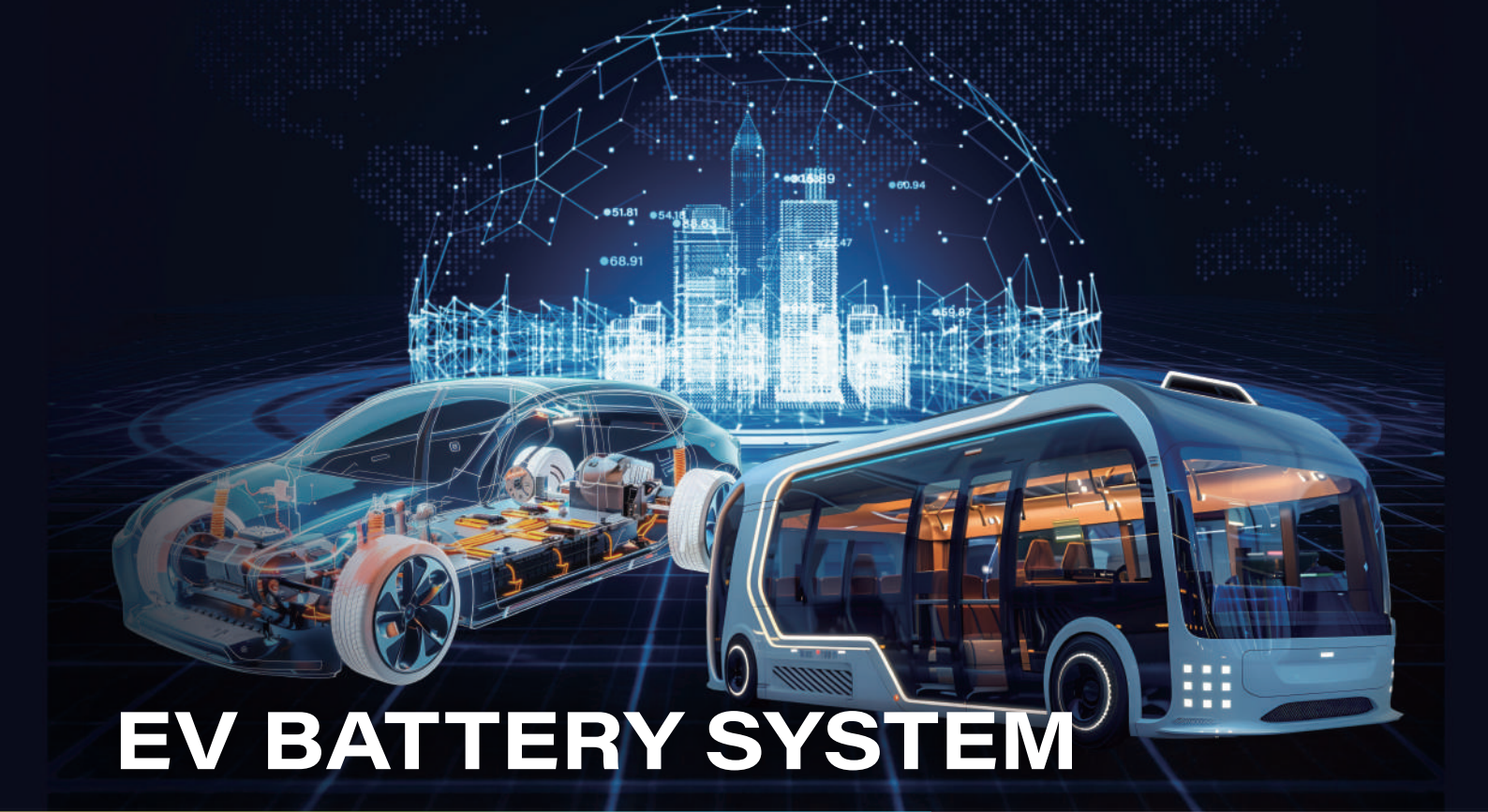
The residential energy storage system  
can be charged with clean energy, which  
helps us move towards a Net-Zero  
sustainable future safely and reliably.



RESIDENTIAL ENERGY  
STORAGE SYSTEM







# EV BATTERY SYSTEM

## High Safety & High Energy Density Battery System



CNS16160

The BSMI of the Ministry of Economic Affairs implements voluntary product verification for batteries and battery systems used in electric vehicles.



IEC62133  
IEC62620

Safety requirements for lithium-ion cells and batteries used in electric road vehicles.



UL1973  
UL2580

Safety standards for electric vehicle batteries (modules).



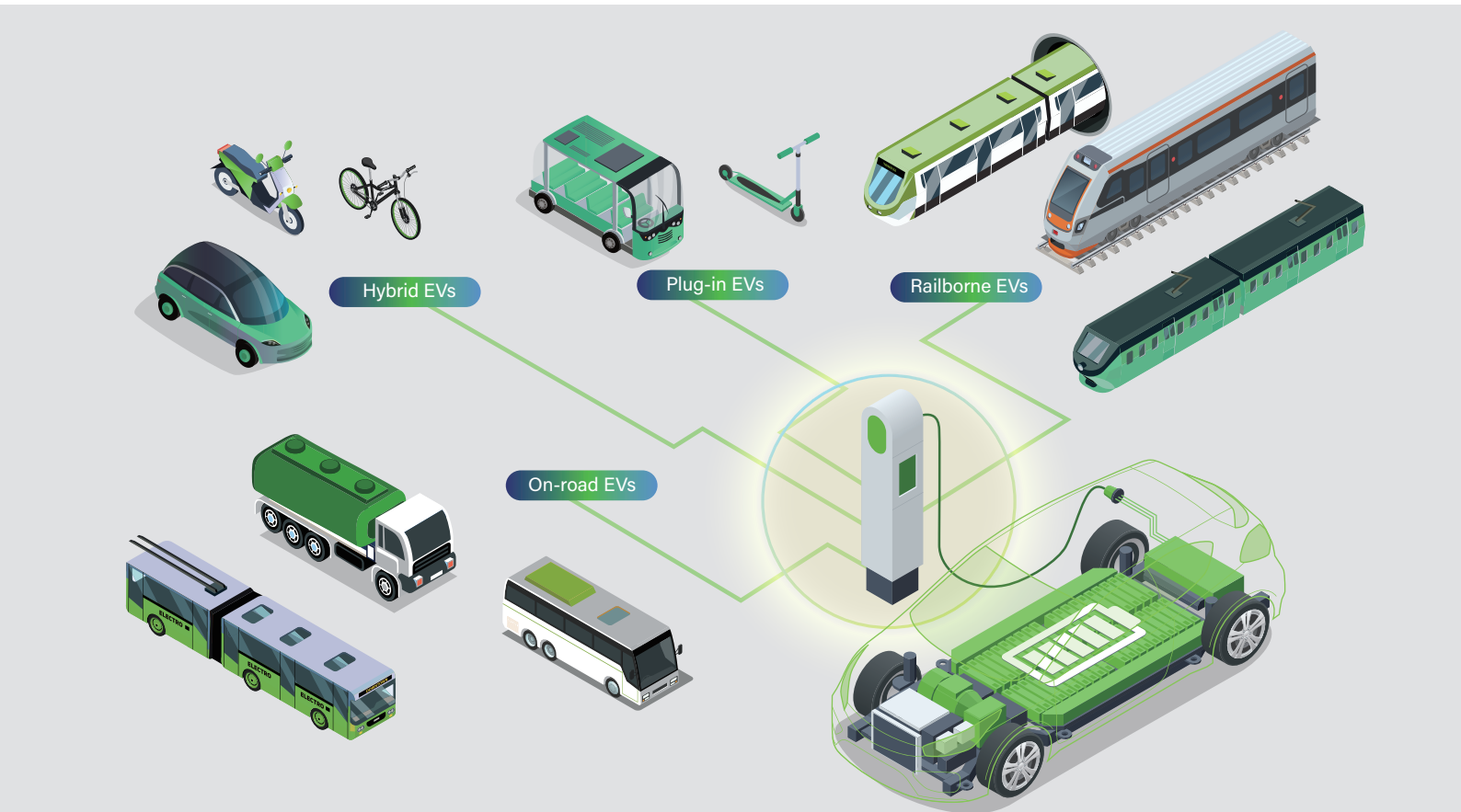
UN38.3

UN safety standard for the shipment of batteries



ECE R100.03

EU safety standards for automotive power batteries.



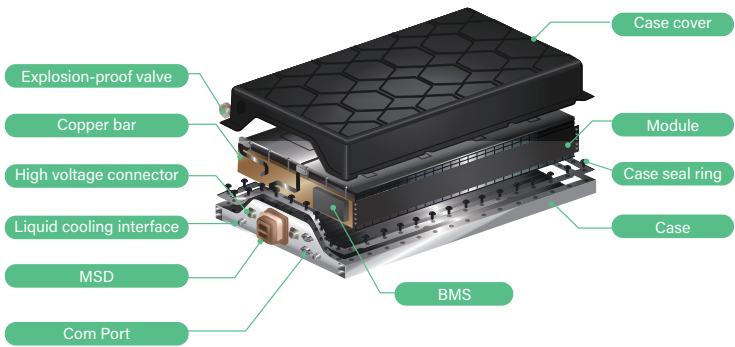
## EV BATTERY SYSTEM

### Electric Bus Battery System

The battery system capacity is approximately 250-300kWh.



The power battery system of Formosa Smart Energy uses domestically produced cells with high energy density and long cycle life. The pack for electric bus is equipped with 30.8 kWh capacity and 153.6V.



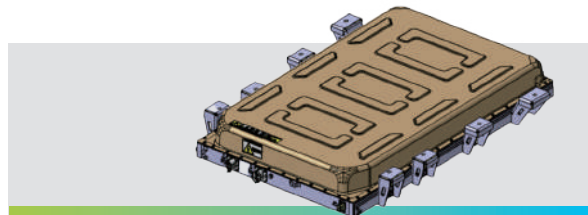
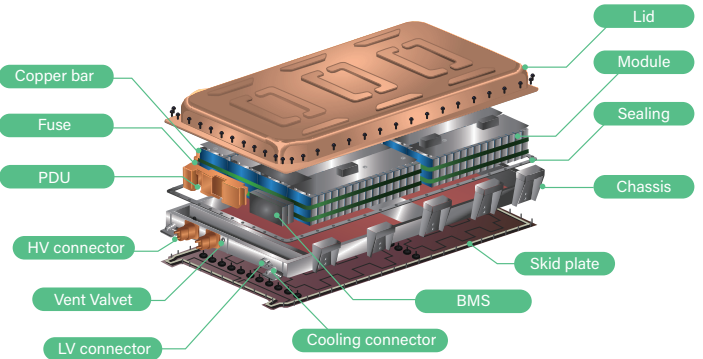
Configuration	3P48S
Nominal Energy	30.87 kWh
Weight Energy Density	≥134 Wh/kg
Nominal Voltage	153.6V
Operational Temperature	Charging: 0~55°C Discharging: -30~60°C
Thermal Management	Liquid cooling
IP Level	IP67
Dimension	1200*710*200 mm
Weight	230 kg

### Electric Commercial Vehicle Battery System

Formosa Smart Energy has started collaborating with domestic automakers to design new electric commercial vehicle models that can utilize our 44.5 kWh battery system.

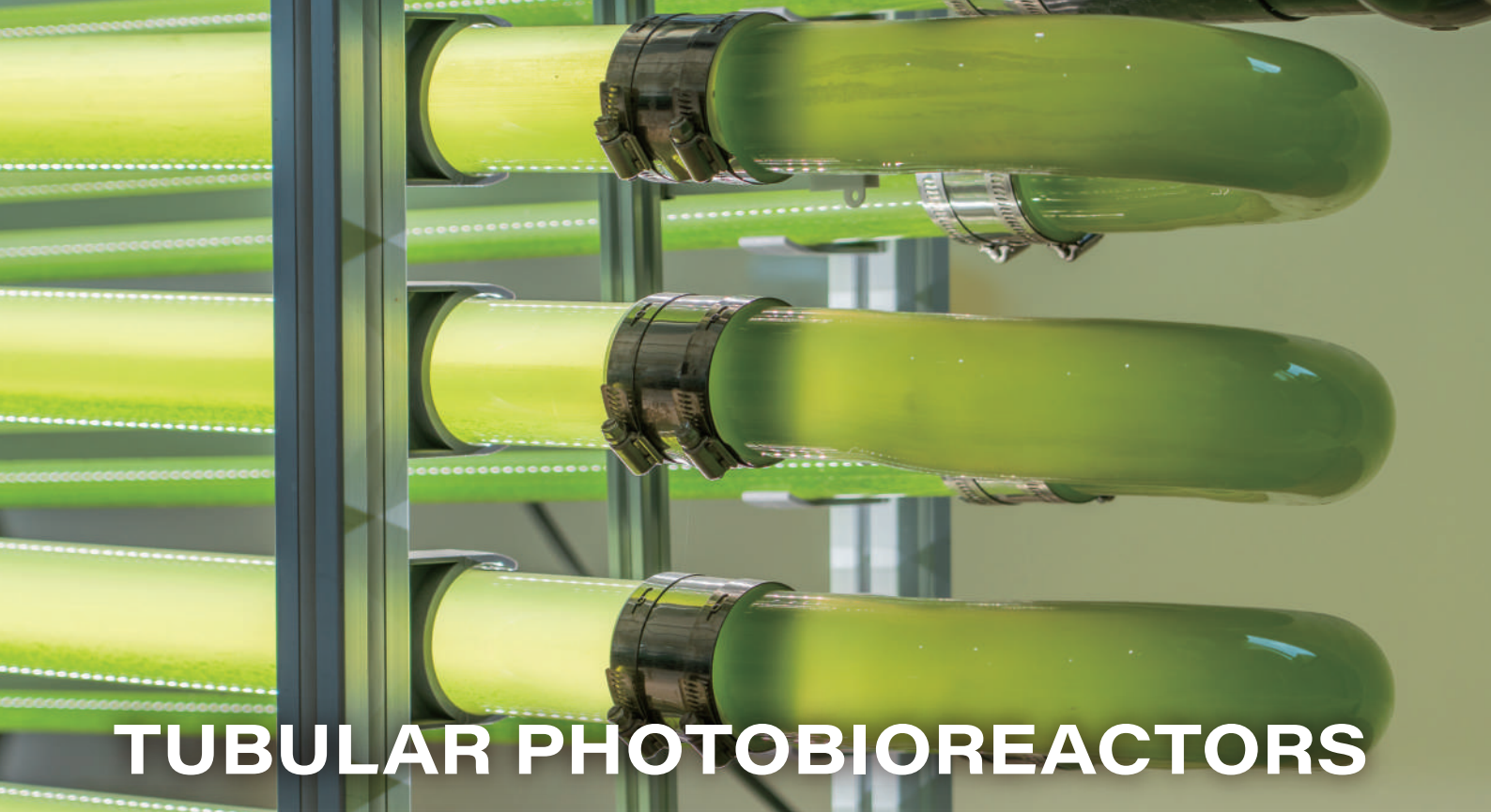


Formosa Smart Energy's electric commercial vehicle battery system is manufactured with domestically produced battery cells with both higher energy density and longer cycle life. The battery pack used has a capacity of 44.5kWh, and a voltage of 332.8V.



Configuration	2P12S/2P14S
Nominal Energy	44.5kWh
Weight Energy Density	>123Wh/kg
Nominal Voltage	332.8V
Operational Temperature	Charging: 0~55°C Discharging: -30~60°C
Thermal Management	Liquid cooling
IP Level	IP67
Dimension	1525*906*211mm
Weight	360kg





# TUBULAR PHOTOBIOREACTORS



- Pipeline Design
- Semi-Automatic Cleaning
- Space-Efficient
- Controlled Environment
- High Carbon-Fixation Efficiency

Model	50L Photobioreactor	150L Photobioreactor	600L Photobioreactor	5000L Photobioreactor
Number of Tubes	10	24	64	352
Volume of Tubes	30	70	400	4,000
TanK [L]	20	100	200	1,000
Land area [L*W*H, cm]	200*100*120	220*100*170	850*150*200	2,500*150*250
Operating temp. [°C]	15~40	15~40	15~40	15~40
Light	RGB	RGB	RGB	RGB



The official website of CH Algae  
Industrial Business



The official website of InnoGT  
Agricultural Business

## MICROALGAE APPLICATION

### WASTEWATER TREATMENT

**ZSMF-02**  
Remove Molybdenum

- pH 4~5
- Applicable Industry : Chemical raw materials manufacturing
- Dosage: 0.1~0.15% (w/w)
- Reaction Time: 10 mins
- Removal Rate: 80~90%

**ZMF-03**  
Remove Zinc

- pH 7~9
- Applicable Industry : Metal-related Manufacturing, Optoelectronics Industry
- Dosage: 0.1% (w/w)
- Reaction Time: 10 mins
- Removal Rate: up to 99%

**BMF-06**  
Remove Boron

- pH9-10
- Applicable Industry : Metal-related Manufacturing
- Dosage: 0.1% (w/w)
- Reaction Time: 10 mins
- Removal Rate: up to 70~80%

**NJ01**  
Multipurpose Agent

- pH 4~8
- Applicable Industr : Food Industry, Daily Necessities
- Replace traditional PAC, resulting in 20% less sludge.

\*Dosage adjustable based on wastewater characteristics

### AGRICULTURAL APPLICATION

**InnoGreat BioM1**

Specification 1,000g/bg

Function

- Formulate with microalgae powder as a nutrient source
- Support large-scale cultivation of various aerobic bacteria
- Beneficial for agricultural and aquacultural applications
- Promote environmental friendly and sustainable practices

**InnoGreat algae**

Specification 1,000g/btl

Function

- Improve water quality and sediment conditions in aquaculture.
- Serve as a preferred nutritional feed for rotifers and other zooplankton.

