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# GREEN ENERGY FOR A BETTER LIFE

TIANNENG BATTERY ENERGY STORAGE SOLUTION

PRODUCT BROCHURE





**\$10.8 billion**

2022 Annual Sales

**A+H Listed**

6888.19.SH/00819.HK

**4000+**

Patents

**No.29**

Global New Energy Enterprise Ranking

# Company Profile

Tianneng is a Global Leading New Energy Company committed to providing environmentally-friendly battery solutions for various industries worldwide since 1986.

Tianneng now has more than 30,000 employees and more than 130 subsidiaries around the world. There are 17 production bases in 7 provinces in China and 1 oversea manufacturing center in Vietnam is under construction. Tianneng set up 7 R&D centers to constantly develop technology and keep innovation in the area of lead acid batteries, lithium batteries, hydrogen Fuel Cells, and Sodium-ion batteries.

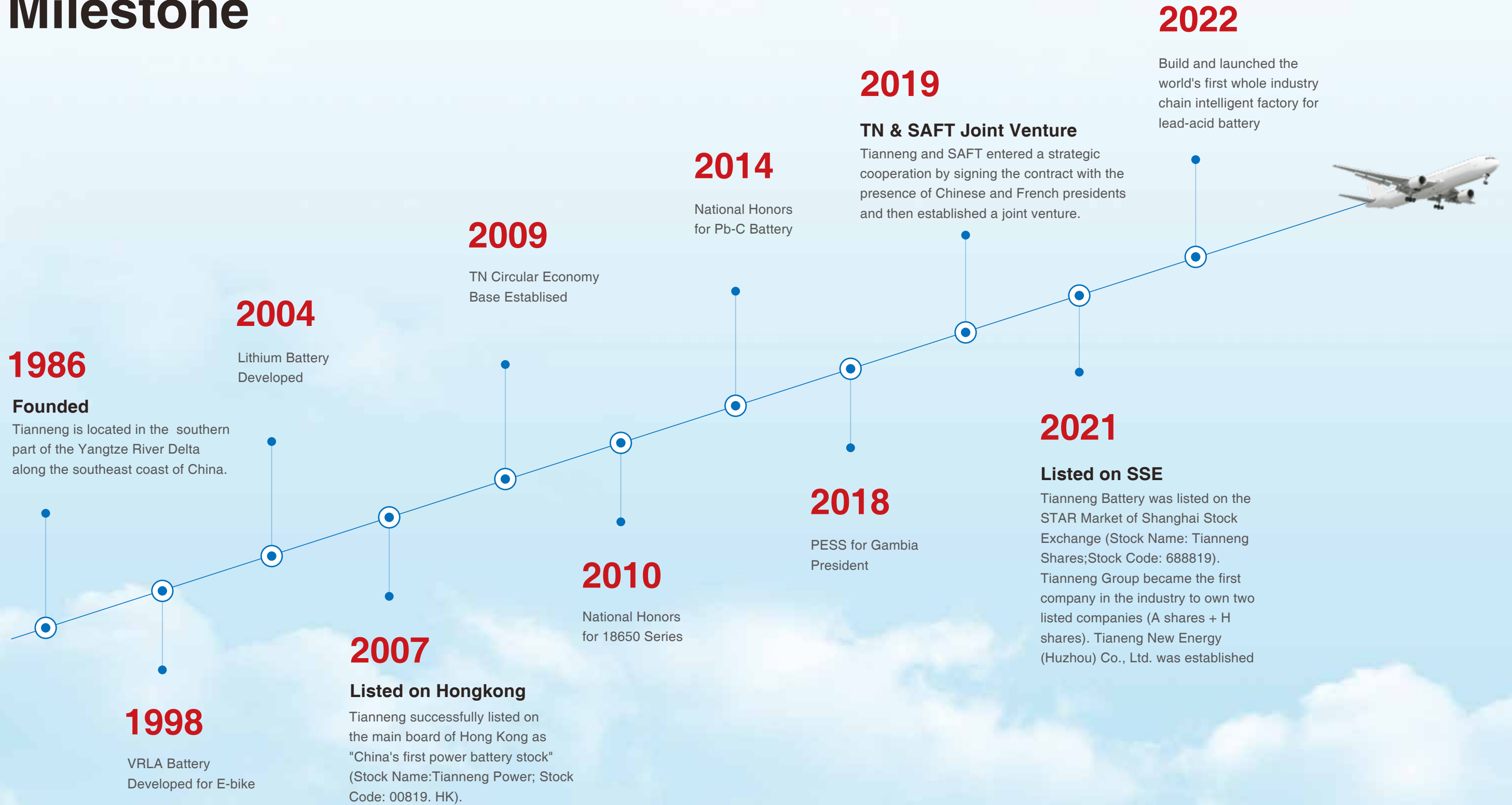
## Honor:

- Top 1 in China Lead Acid Battery
- Top 10 in the Chinese battery industry
- Top 500 Chinese enterprises
- Global top 500 new energy enterprises

## Main Business areas:

- Battery and system Solutions (Motive, SLI, Energy Storage)
- Battery Recycling Solutions (Lead Acid battery recycling, Lithium-ion battery recycling)

# Milestone



# Global Footprint

- 100+ Countries Footprint.
- 11+ Oversea Branches.
- Tianneng has a global footprint around the world, our business covering more than 100 countries and regions.

- **Market Performance**  
2022 Global Delivery: **110Gwh+**

## Headquarters

**HQ:** Huzhou, Zhejiang, China  
**INT HQ:** Hongkong, China

## Branch

**APAC:** Vietnam, Thailand, Indonesia, Philippines, Australia & New Zealand

**India:** India

**MENA (Middle East and North Africa) :** South Africa, Turkey

**Americas:** America, Argentina, Colombia

**Europe:** Netherlands, Germany



# Technology And Innovation

Tianneng has the first domestic motive battery automatic continuous casting, rolling, continuous punching, and continuous coating production demonstration line, the domestic first small-density power battery intelligent automatic assembly demonstration production line and other digital production lines and a complete digital industry. The supply chain has the leading advantages of high equipment utilization, relatively stable production capacity, high product quality, flexible operation, and great product adaptability.



## I Advantages and Strengths



### Material Innovation

Research and innovation and on NCM/LFP/LMFP material, which guarantee the performance and safety from start point.



### Manufacturing Development

Fully-automation manufacturing system maintain high-level of consistency on cells and packs.











### SELF-DEVELOPMENT BMS

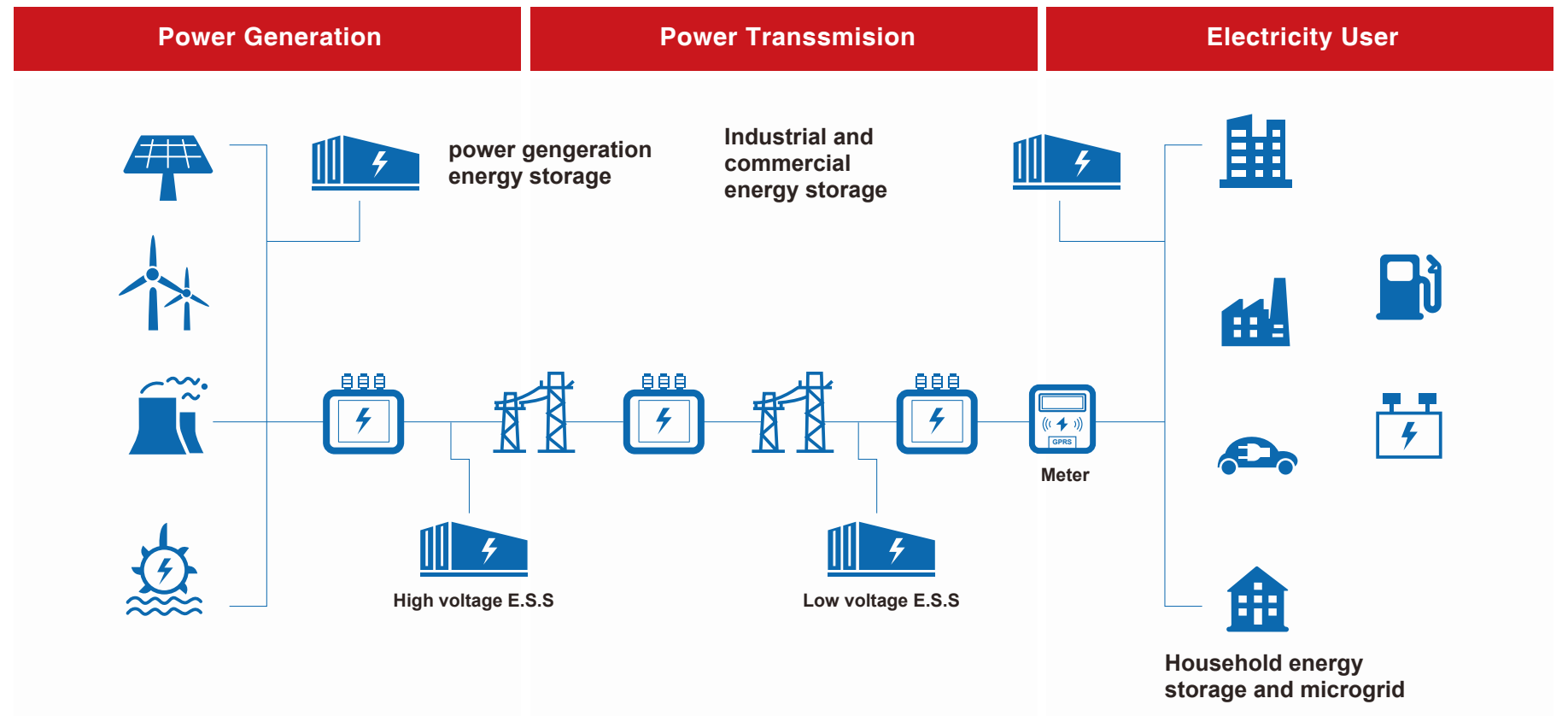
Providing intelligent and customized management through accurate battery dynamic monitoring technology.



# Premium Safety And Performance

## Intelligent Protection

-  Over-discharge Protection
-  Over-charge Protection
-  Cell-balance Mechanism
-  Short-circuit Prevention
-  Over-current Protection
-  Instant-impact Protection
-  Cut-off Monitoring
-  GPS Function Available



UN38.3



IEC

CB

CE

BIS





**Application**

- Household
- Solar Energy
- Other renewable energy



**Application**

- UPS/EPS
- Telecommunication
- Electric Power



**Application**

- Power grid
- Power station
- Power plant

# Battery Energy system

Tianneng provides solutions for energy storage, reserve and other industrial scenarios, with excellent product cycle performance, stability and reliability, to provide customers with solid green energy guarantee.

## Product Series

- Household energy system
- Commercial and Industrial ESS
- Container C&I ESS

# HESS

## Household energy storage system

*Green house with economic energy*



### Product Application



#### Saving Electricity Bill

Charging during off-peak hours and discharge during peak hours, save the bill from avoiding peak hours.



#### Self-consumption

Balance the solar generation with evening demand, realize your own grid independence.



#### Back-up Power

Guarantee your electricity is available when encounter with black-out or emergency.

# Stackable HESS Products

## Low voltage model

### Stackable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 100Ah 5.12kWh.
- 1 to MAX.6 layers recommended.
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP65 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system

### LOW VOLTAGE MODEL

	Model	TELiF-HESS 48100 GL	TELiF-HESS 4850 GL
<b>Battery Module</b>	Single Module	51.2V 100Ah	51.2V 50Ah
	Battery Energy	5120 Wh	2560 Wh
	Nominal Charge/Discharge Current	50A	25A
	Max Charge/Discharge Current	100A	50A
	Working Voltage	43.2~56.16Vdc	
<b>General Specification</b>	Dimension (WxDxH)	600*210*300mm	600*210*180mm
	Weight	48kg	27kg
	Scalability	1-6 batteries in parallel	1-10 batteries in parallel
	Installation	Stacked	
	Charge Temperature	0°C~55°C	
	Discharge Temperature	-20°C~60°C	
	IP Rating	IP 65	
	Cell Technology	LiFePO4	
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C	
<b>Communication</b>	Communication	RS485、CAN	
	Display	SOC status indicator, LED indicator	

# Stackable HESS Products

## High voltage HESS model

### Stackable LiFePO4 Battery for Energy Storage System

- High-voltage LiFePO4 battery solution, Single module is 51.2V 50Ah 2.56kWh.
- 3 to 10 layers recommended.
- Inverter you need to choose 380V 3phase input and output, common is 8-15KW inverter.
- Applicable on grid or hybrid on and off-Grid solar energy storage system.
- Self-Consumption Optimization for Residential and Commercial Applications.



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP65 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system

### HIGH VOLTAGE MODEL

	Model	TELiF-HESS 4850 GH
<b>Battery Module</b>	Single Module	51.2V 50Ah
	Battery Energy	2560 Wh
	Nominal Charge/Discharge Current	25A
	Max Charge/Discharge Current	50A
	Dimension(WxDxH)	600*210*160mm
<b>High-voltage Box</b>	Weight	26.5kg
	Dimension(WxDxH)	600*210*250mm
	Weight	23kg
<b>General Specification</b>	Scalability	3-10 batteries in series
	Installation	stacked
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
	IP Rating	IP 65
	Cell Technology	LiFePO4
<b>Communication</b>	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# Wall Mounted HESS Products

Low voltage model

## integrated LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 100Ah /200aH 5.12kWh/10.24KWh.
- Max 15 batteries in parallel.
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP65 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system

### LOW VOLTAGE MODEL

	Model	TELiF-HESS 48100 W	TELiF-HESS 48200 W
<b>Performance</b>	Specification	51.2V 100Ah	51.2V 200Ah
	Battery Energy	5120 Wh	10240 Wh
	Nominal Charge/Discharge Current	50A	100A
	Max Charge/Discharge Current	100A	200A
	Working Voltage	43.2~56.16Vdc	43.2~56.16Vdc
<b>General Specification</b>	Dimension(WxDxH)	520*141.5*470mm(EU) 540*141.5*500mm(US)	800*590*142mm
	Weight	47.2kg	96.5kg
	Installation	Wall mounted/Floor stand	
	Charge Temperature	0°C~55°C	
	Discharge Temperature	-20°C~60°C	
<b>Communication</b>	IP Rating	IP 65	
	Cell Technology	LiFePO4	
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C	
	Scalability	Max 15 batteries in parallel	
	Communication	RS485、CAN	
Display	SOC status indicator, LED indicator		

# Rack Mounted HESS Products

Low voltage model

## Removable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 100Ah 5.12kWh.
- Max. 15pcs in Parallel
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP20 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system
- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

### LOW VOLTAGE MODEL

	Model	TELiF-48100S3
<b>Performance</b>	Specification	51.2V 100Ah
	Battery Energy	5120 Wh
	Nominal Charge/Discharge Current	50A
	Max Charge/Discharge Current	100A
<b>General Specification</b>	Working Voltage	43.2~56.16Vdc
	Dimension(WxDxH)	440*550*133mm
	Weight	43kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
<b>Communication</b>	IP Rating	IP 20
	Cell Technology	LiFePO4
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Scalability	Max 15 batteries in parallel
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# Rack Mounted HESS Products

Low voltage model

## Removable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 150Ah 7.68kWh.
- Max. 15pcs in Parallel
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP20 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system
- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

### LOW VOLTAGE MODEL

	Model	TELiF-48150
<b>Performance</b>	Specification	51.2V 150Ah
	Battery Energy	7680 Wh
	Nominal Charge/Discharge Current	75A
	Max Charge/Discharge Current	150A
<b>General Specification</b>	Working Voltage	43.2~56.16Vdc
	Dimension(WxDxH)	456*603*133mm
	Weight	72kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
<b>Communication</b>	IP Rating	IP 20
	Cell Technology	LiFePO4
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Scalability	Max 15 batteries in parallel
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# Telecom Energy Storage HESS Products

Low voltage model

## Removable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 100Ah 5.12kWh.
- Max. 15pcs in Parallel
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



### PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP20 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

### CERTIFICATES



### APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system
- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

### LOW VOLTAGE MODEL

	Model	TTLiF-48100
<b>Performance</b>	Specification	51.2V 100Ah
	Battery Energy	5120 Wh
	Nominal Charge/Discharge Current	50A
	Max Charge/Discharge Current	100A
	Working Voltage	43.2~56.16Vdc
<b>General Specification</b>	Dimension(WxDxH)	440*550*133mm
	Weight	43kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
<b>Communication</b>	IP Rating	IP 20
	Cell Technology	LiFePO4
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Scalability	Max 15 batteries in parallel
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# Telecom Energy Storage HESS Products

Low voltage model

## Stackable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 150Ah 7.68kWh.
- Max. 15pcs in Parallel
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



## PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP20 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

## CERTIFICATES



## APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system
- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

## LOW VOLTAGE MODEL

	Model	TTLiF-48150
<b>Performance</b>	Specification	51.2V 150Ah
	Battery Energy	7680 Wh
	Nominal Charge/Discharge Current	75A
	Max Charge/Discharge Current	150A
	Working Voltage	43.2~56.16Vdc
<b>General Specification</b>	Dimension(WxDxH)	456*603*133mm
	Weight	72kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
<b>Communication</b>	IP Rating	IP 20
	Cell Technology	LiFePO4
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Scalability	Max 15 batteries in parallel
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# Telecom Energy Storage HESS Products

Low voltage model

## Removable LiFePO4 Battery for Energy Storage System

- 51.2V Low voltage LiFePO4 battery module, Single module is 51.2V 200Ah 10240kWh.
- Max. 15pcs in Parallel.
- Compatible with the 48V single or three phase off grid, hybrid on/off grid solar inverter.
- Capable of High-Powered Emergency-Backup and Off-Grid Function.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transport and Installation



## PRODUCT FEATURE

- >6000 Times Super Cycle Life
- IP20 waterproof design
- Premium safety and Long-term reliability
- Money saving & Flexible compatibility
- Low self-consumption maximization
- Affordable and simple installation

## CERTIFICATES



## APPLICATION

- Household Energy Storage System
- Household Photovoltaic System
- Outdoor portable power station
- Removable power supply system
- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

## LOW VOLTAGE MODEL

	Model	TTLiF-48200
<b>Performance</b>	Specification	51.2V 200Ah
	Battery Energy	10240 Wh
	Nominal Charge/Discharge Current	100A
	Max Charge/Discharge Current	200A
<b>General Specification</b>	Working Voltage	43.2~56.6Vdc
	Dimension(WxDxH)	400*800*240mm
	Weight	80kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
<b>Communication</b>	IP Rating	IP 20
	Cell Technology	LiFePO4
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C
	Scalability	Max 15 batteries in parallel
	Communication	RS485、CAN
	Display	SOC status indicator, LED indicator

# All In One Lead Carbon ESS

- Full intelligent digital energy storage equipment.
- Work continuously at full power for a long time.  
Multiple DC output ports (5V/3Aports,12V/2A ports,TypeC ports).
- Built-in long-life and deep-cycle sealed valve-controlled GEL battery.
- PFC technology, high power factor, and reduce the usage of grid.
- Advanced MPPT technology,with efficiency no less than 99.5%.
- Bypass automatic switching function  
EMC design for the AC output, reducing interference to the AC loads.



## PRODUCT FEATURE

- All-in one design
- Lead-acid/Lead carbon/LFP option
- Plug and play
- Solar/Utility power source
- Real-time monitor

## APPLICATION

- Oil generator charging
- Solar charging
- Utility output
- Inverter output
- energy management

## PRODUCT PARAMETERS

Model	TNAiO-1022-AL0210S2	TNAiO-1522-AL0210S1	TNAiO-2522-AL0315S1	
<b>Utility input</b>	Rated Utility work voltage			220VAC
	Utility work voltage range			176VAC~285VAC
	Utility input frequency range			45Hz-65Hz
	Max.Utility work current (Charging+Bypass)	2.2A for charging+4.5A for bypass@220VAC	2.8A for charging+6.8A for bypass@220VAC	3.5A for charging+11.4A for bypass@220VAC
	Utility transfer time	Utility bypass to Inverter output: <10ms Inverter output to Utility bypass: Oms		
AC input overload relay	YES			
<b>Inverter output</b>	Rated output power(@25°C)	1000W	1500W	2500W
	Surge output power(5s)	1500W	2000W	4000W
	Rated output voltage	220VAC±3%		
	Rated output frequency	50Hz/60Hz±0.2%		
	Output wave	Pure sine wave		
	Output distortion THD	≤3%(Resistive load)		
	Output soft start	HAVE		

**PRODUCT PARAMETERS**

Model	TNAiO-1022-AL0210S2	TNAiO-1522-AL0210S1	TNAiO-2522-AL0315S1
Max. PV input withstand voltage	95V	95V	145V
Solar controller type	MPPT		
MPPT efficiency	>99.5%		
MPPT voltage range	30V~80V	30V~80V	30V~120V
MPPT ways	One way	One way	One way
Max. PV output charging current	16.5A	21A	30A
Battery type	Lead-Acid / Gel / Lead-Carbon		
Rated battery voltage	24VDC		
Battery work voltage range	21VDC-30VDC		
Battery work temperature range	Discharging Mode:-20°C~55°C; Charging Mode:0C~40C		
Rated battery capacity	55Ah*2	70Ah*2	120Ah*2

**Solar controller**

**Battery**

**PRODUCT PARAMETERS**

Model	TNAiO-1022-AL0210S2	TNAiO-1522-AL0210S1	TNAiO-2522-AL0315S1
DC 12V port	12V2A*2		
USB-A port	5V3A*2		
TYPE-C (USB-C) port	TYPE C-100W*1pcs(support PD3.0 and multiple protocols)TYPE C-5V/3A*1pcs		
DC output switch	HAVE		
Work temperature range	-20°C~55°C (when the environment temperature exceeds 25°C, the charging power and load power will be reduced appropriately; working of full load is not supported.)		
Enclosure	IP20		
Communication method	RS485, BlueTooth (GRPS/WiFi optional)		
LCD	Monochrome LCD, English interface		
Warranty	Two years		
Dimension (Length x Width x Height)	255x406x541mm (with floor mats and handles)	288x449x586mm (with wheels and handles)	435x504x574.5mm (with wheels and handles)
Net weight	55kg	65kg	107kg

**DC output**

**Others**

# All In One Energy Storage System

- Integrated CE certificated LFP battery and Hybrid PV inverter in one system.
- LiFePO4 battery module, Single module is 51.2V 100Ah.
- 1 to 3 layers recommended, every layer 2 modules loaded.
- Cobalt Free Lithium Iron Phosphate (LFP) Battery:
- Maximum Safety, Life Cycle and Power.
- Applicable on grid or hybrid on and off-Grid solar energy storage system.
- Self-Consumption Optimization for Residential and Commercial Applications.
- Modular Design Simplifies Transportation and Installation.



US Split phase    EU Single Phase    EU Three phase

## PRODUCT FEATURE

- All-in one design
- Plug and play
- Solar/Utility power source
- ≥6000 Cycle Li-ion battery
- Remote monitoring

## APPLICATION

- Household power supply
- Communication base station
- Farm energy storage
- Villa power supply
- Field powersupply

## CERTIFICATES

**IEC/EN62109-1/-2,  
IEC/EN62477-1/UN38.3  
Europe: EN50549-1,  
Germany: VDE4105/0124,  
UK: G99,  
South Africa: NRS097-2-1:  
2017UN38.3**

## PRODUCT PARAMETERS-EU standard single phase

### Battery

Number of layers	1 layer		2 layers		3 layers	
	51.2V 200Ah	51.2V 300Ah	51.2V 400Ah	51.2V 500Ah	51.2V 600Ah	
Model	51.2V 200Ah	51.2V 300Ah	51.2V 400Ah	51.2V 500Ah	51.2V 600Ah	
Energy (kWh)	10.24	15.36	20.48	25.6	30.72	
Weight (KG)	200	260	320	380	440	
Dimension (L*W*H) mm	653*320*1400		653*320*1950		650*320*2500	
Operating Voltage Range(V)	43.2V~56.16					
Cell technology	Lithium-iron phosphate (LiFePO4)					
Life cycle	6000 times @80%DOD 25℃ 0.5C					
Max. charge/discharge current(A)	120					

### PV Input

Max. power(kW)	9	9
Max. DC voltage (V)	550	
MPPT voltage range(V)	70-520	
Max.Input current of single MPPT(A)	15/15	
String per MPPT tracker	1	
No.of MPPT trackers	2	

**PRODUCT PARAMETERS-US standard TELiF-Ai0 48100 US**

**Battery**

Number of layers	1 layer		2 layers		3 layers	
Model	51.2V 200Ah	51.2V 300Ah	51.2V 400Ah	51.2V 500Ah	51.2V 600Ah	
Energy (kWh)	10.24	15.36	20.48	25.6	30.72	
Weight (KG)	200	260	320	380	440	
Dimension (L*W*H)mm	653*301.5*1368		653*301.5*1886		653*301.5*2404	
Operating Voltage Range (V)	43.2V~56.16					
Cell technology	Lithium-iron phosphate (LiFePO4)					
Life cycle	6000 times @80%DOD 25 C 0.5C					
Max. charge/discharge current(A)	190					

**PV Input**

MAX PV Power (kw)	12	13
Max PV voltage (V)	500	
Max input current (input A/input B) (A)	14/14	
Max short current (input A/input B) (A)	20/20	
Start operating voltage (V)	90	
MPPT voltage range (V)	120~500	
No.of MPPT trackers	4	
String per MPPT tracker	1	

**PRODUCT PARAMETERS-US standard TELiF-Ai0 48100 US**

**AC Output**

Rated output power(kVA)	8	10
Max. apparent Power (kVA)	8.8	11
Max. output current(A)	38.3	47.8
Ac output voltage(V)	120/240(split phase), 208(2/3 phase), 230 (single phase)	
Frequency (Hz)	50/60	
PF	0.8lagging-0.8leading	
THDI	< 3%	
AC output topology	Split phase, 2/3 phase, single phase	

**EPS output**

Rated power(kVA)	8	10
Rated output voltage(V)	120/240 (split phase), 208 (2/3 phase),230 (single phase)	
Rated output current(A)	38.3	47.8
Rated frequency(Hz)	50/60	
Automatic switching time(ms) 20 THDI	< 2%	
Overload capacity	125%,60S/150%,1S	

**PRODUCT PARAMETERS-US standard TELiF-Ai0 48100 US**

**General Data**

Display	LCD
Communication	Modbus, RS485, WIFI, 4G
Operating temperature	-20 C ~55 C
Environment	Indoor
Relative humidity	5%~95%
Max. efficiency	≥98.2%
North American efficiency	≥97.2%
Cooling	Natural convection and Fan cooling
Certification	UL9540, UN38.3,MSDS

**PRODUCT PARAMETERS-EU standard three phase TELiF-Ai0 48100 EU/T**

**Battery**

Number of layers	1 layer	2 layers	
Dimension (L*W*H)	653*301.5*1328	653*301.5*1846	
Model	204.8V 52Ah	307.2V 52Ah	409.6V 52Ah
Weight(KG)	222.5	282.5	342.5
Energy(kWh)	10.65	15.97	21.3
Operating Voltage Range	172.8V~233.6V	259.2V~350.4V	345.6V~467.2V
Life cycle	6000 times @80%DOD 25 C 0.5C		
Rated charge/discharge current(A)	40A		

**AC output**

Rated output power(kVA)	10
Max. output current(A)	15.9
Grid voltage/range(V)	400/360~440
Frequency (Hz)	50/60

**EPS output**

Rated power(kVA)	11
Rated output voltage(V)	400
Max. output current(A)	15.9
Rated frequency(Hz)	50/60
Overload capacity	110%,30S/120%, 10S/150%,0.02S

**General Data**

Battery charge /discharge efficiency	96.7%
DC Max. efficiency	98.2%
MPPT efficiency	99.5%
Ingress protection	IP65
Noise emission (dB)	<35
Operation temperature	25C~60C
Cooling	Natural Cooling

# Singe/Three Phase Hybrid Inverter



Supports automatic battery switching;



Parallel available, intelligent BMS



Support diesel generator input source;



Input power source priority can be set by users;



Compatible with lead-acid and lithium-ion batteries;



Battery reverse connection protection, anti-power control function



## PRODUCT PARAMETERS

Model Name	TN-INVT-SH3000	TN-INVT-SH4000	TN-INVT-SH5000	TN-INVT-SH6000
<b>Off-grid Output</b>				
Nominal Output Power	3000W	4000W	5000W	6000W
Nominal Voltage	220V/230V/240V			
Nominal Frequency	50/60HZ			
Nominal Output Current	13.6A	18.2A	22.7A	27.2A
Output THDu	<2%			
<b>On-grid Parameter</b>				
Nominal Output Power	3500W	5000W	6000W	6000W
Max. Output Current	18.2 A	22.7A	27.2A	27.2A
Nominal Grid Voltage	220V			
Max. loutput Current from Grid	16.4A	22.7A	27.2A	27.2A
Grid Voltage Range	184-264V			
Frequency Range	45-65HZ			

**PRODUCT PARAMETERS**

Model Name	TN-INVT-SH3000	TN-INVT-SH4000	TN-INVT-SH5000	TN-INVT-SH6000
<b>PV Input</b>				
Max. Input Power	4500Wp	6000Wp	8000Wp	9000Wp
Starting Voltage	75V			
Max. Input Voltage	600V			
MP PT Voltage Range	80-550V			
Full Load MP PT Voltage Range	350-500V			
Number of MPPT	2			
Max. Input String Per MPPT	1			
Nominal Input Voltage	360V			
Max. Input Current	13A/13A			
<b>Battery Parameter</b>				
Battery Type	Lithium-ion			
Nominal Battery Voltage	48V			
Battery Voltage Range	42-60V			
Max. Charging Voltage	W60V			
Max. Charging/Discharging Current	75A	85A	100A	100A

**PRODUCT PARAMETERS**

Model Name	TN-INVT-SH3000	TN-INVT-SH4000	TN-INVT-SH5000	TN-INVT-SH6000
<b>Efficiency</b>				
Max. Efficiency	97.5%	97.8%	98.0%	98.0%
European Efficiency	97.2%	97.3%	97.5%	97.5%
Max. Battery Charging/Discharging Efficiency	95.2%			
<b>General Data</b>				
Size(L*W*H)	515mm*490mm*184mm			
Weight	20kg			
Noise	<25dB(A)			
Operating Temperature Range	25°C~+60°C			
Cooling Method	Natural cooling			
Ingress Protection Grade	IP65			
Monitoring	H5/LED/APP/WIFI/4C/Bluetooth			
Communication Port	RS485/CAN/DRED/DO/Para 1 lei port			
Protection	DC Switch, PV Insulation Resistance Detection, Residual Current Monitoring, Anti-islanding Protection, PV Reverse Polarity Protection, AC Short Circuit Protection, AC Overcurrent Protection, AC Overvoltage Protection, Surge Protection, Lightning Protection			
<b>Certification</b>				
CE_LVD	IEC 62109-1, 1 EC 62109-2, EN 62109-1, EN 62109-2			
CE EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4			
Grid	VDE-AR-N 4105, VDE V 0126-1-1, C98, C99, C 0-21, EN50549, NRS 097-2-1, AS 4777.2, R25			

# Single-phase ESS Hybrid Inverter



Supports automatic battery switching;



Support diesel generator input source;



Compatible with lead-acid and lithium-ion batteries;



Parallel available, intelligent BMS



Input power source priority can be set by users;



Battery reverse connection protection, anti-power control function



Technical specification	R3KL1	R3K6L1	R4KL1	R4K6L1	R5KL1	R6KL1
<b>Input (PV)</b>						
Max. power (kW)	4.6	4.6	6	6	7	7
Max. DC voltage (V)	550					
MPPT voltage range (V)	125~500					
Max. input current of single MPPT (A)	14					
MPPT tracker/strings	2/1					
<b>AC output</b>						
Rated output power (kVA)	3	3.6	4	4.6	5	6
Max. output current (A)	13	16	17.4	20	21.7	26
Grid voltage/range (V)	230/176~270					
Frequency (Hz)	50/60					
PF	0.8lagging-0.8leading					
THDi	<3%					
AC output topology	L+N+PE					

Technical specification	R3KL1	R3K6L1	R4KL1	R4K6L1	R5KL1	R6KL1
<b>Battery</b>						
Battery voltage range (V)	40~58					
Max.charging voltage (V)	58					
Max.charge/discharge current (A)	95/62.2	95/75	95/83.3	95/95.8	95/104.2	95/110
Battery type	lithium /Lead-acid					
Communication interface	CAN/RS485					
<b>EPS output</b>						
Rated power (kVA)	3	3.6	4	4.6	5	6
Rated output voltage (V)	230					
Rated output current (A)	13	16	17.4	20	21.7	26
Rated frequency (Hz)	50 /60					
Automatic switching time (ms)	<20					
THDu	<2%					
Overload capacity	110%, 30S/120%, 10S/150%, 0.02S					

Technical specification	R3KL1	R3K6L1	R4KL1	R4K6L1	R5KL1	R6KL1
<b>General data</b>						
Battery chage/discharge efficiency	95.0%					
DC Max. efficiency	97.6%					
Europe efficiency	97.0%					
MPPT efficiency	99.9%					
Ingress protection	IP65					
Noise emission (dB)	<35					
Operation temperature	- 25℃ ~60℃					
Cooling	Natural					
Relative humidity	0 ~95% (non-condensing)					
Altitude	2,000m (>2,000 Derating)					
Dimensions W*D*H (mm)	550*200*515					
Weight (kg)	25					
Isolation transformer	No					
Self-consumption (W)	<3					
<b>Display and communication</b>						
Display	LCD					
intercace:rs485/4G/wifi/can/DRM	Yes/ Opt/ Opt/ Yes/ Yes					
Safety standard	IEC/EN62109-1/-2, IEC/EN62477-1					
EMC	IEC/EN 61000-6-1, IEC/EN 61000-6-3					
On-grid	South Africa NRS097-2-1:2017, UK G98, G99					

# Solar On/Off Grid Integrated Inverter

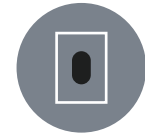
GH3600TL/4600TL/5000TL



Multiple operating modes, on-grid, off grid and UPS, MPPT charger built in.



Integrated smart APP, can remotely diagnose and update



DC couple and AC couple to retrofit existing solar system



Compatible with almost all 48V LiFePO4 battery pack



Frequency droop control, Max. 16pcs parallel



One key to reactive the LiFePO4 battery pack



Model	GH5000TL	GH4600TL	GH3600TL
<b>PV Input (DC)</b>			
Max. DC input power (W)	7000W	6600W	5200W
Max PV input voltage (V)	500V		
Starting voltage	150V		
PV input voltage range	150V-500V		
MPPT voltage range	120V-430V		
MPPT quantity	2		
Max string quantity to each MPPT group	1		
Max input current	15A/15A		
<b>Output/Input (AC)</b>			
Rating output power	5000W	4600W	3600W
Maximum output apparent power	5500VA	5000VA	3960VA
Max output current	22.8A	22.8A	18A
Rating grid voltage	230V		
Rating grid frequency	50HZ		
Total current waveform distortion rate	<3% (Rating power)		
DC component	<0.5%In		
Power factor range	>0.99@Full power (Adjustable range 0.8lead-0.8lag)		

Model	GH5000TL	GH4600TL	GH3600TL
<b>Off grid output</b>			
Max output power	4500W	4500W	3600W
Rating output voltage	230V		
Rating output frequency	50Hz (60Hz Optional)		
UPS switching time	<20ms		
Total harmonic distortion (linear load)	<3%		
Overload capacity	110%, 30S/120%, 10/150%80ms		
<b>Battery</b>			
Voltage range	41.6V-58.5V		
Max charging current	95A (PV&AC Hybrid charging)	95A (PV&AC Hybrid charging)	80A (PV&AC Hybrid charging)
Max discharging current	100A	100A	85A
Battery type	Lithium-Ion battery / Lead-acid Battery		
Communication interface	RS485 / CAN		
<b>Efficiency</b>			
Max efficiency	98%		
European efficiency	97%		
Max discharge efficiency	95%		
MPPT efficiency	99.90%		

Model	GH5000TL	GH4600TL	GH3600TL
<b>System</b>			
Waterproof Rating	IP65		
Noise	<35dB		
Ambient temperature	-25℃ ~60℃		
Cooling mode	Natural cooling		
Ambient humidity	0-95% non-condensing		
Altitude	No derating below 2000m		
Shutdown self power consumption	<3W		
Display	LCD		
Communication	RS485/USB/CAN/Wifi (GPRS optional)		
Certificate	IEC62109-1, IEC62109-2EN61000-6-1, EN61000-1-3 VDE-AR-N4105, EN50549, G99, CEI-021, AS/NZS4777.2, RD1699 (UNE206006IN: 2011/UNE206007-1IN:2013/UNE217002:2020)		
Warranty	5Years		
<b>Mechanical</b>			
Dimension	580mm×350mm×230mm		
Installation	Wall Mounted		
Weight	23.5Kg		

# CESS

## Commercial and Industrial Energy Storage Solution

*Powering the business forward*



### Product Application



#### Uninterrupted Power Supply

Less space, longer life and more power than traditional UPS system.



#### Peak-shifting

Balance the electricity input and output to provide the most economic power supply.



#### Energy Integration

Integrated with existing energy facilities, like solar, diesel generator and so on.

# Outdoor Battery Energy Storage Cabinet

- Real-time data backup.
- Automatic fire fighting system with high safety.
- Grid and off-grid switching function.
- One-button start, automatic operating and it support multiple parallel connection.
- Protection class IP55, suitable for outdoor use.
- Four layers of safety protection design for higher safety and reliability.
- Remote viewing service.



## PRODUCT FEATURE

- All-in one integrated design
- LiFePo4 battery
- Support parallel mode
- Support Solar/City Grid
- EMS/Cloud APP

## APPLICATION

- Small industrial and commercial
- Industrial parks
- Commercial buildings
- Solar storage and charging stations
- Microgrid power backup

## CERTIFICATES

**GB/T 36558    IEC 62933**  
**GB/T 34120    UN3480**  
**UK G99        UN38.3**  
**IEC62619**

## PRODUCT PARAMETERS

Model	CESS-AiO 30P M30S ESS215	CESS-AiO 60P M60S ESS215
Cell type	LiFePO4, 3.2V 280Ah	LiFePO4, 3.2V 280Ah
System configuration	1P100S (5 Modules) ~1P240S (12 Modules)	1P140S (7 Modules) ~1P240S (12 Modules)
Battery capacity (BOL)	89kWh~215kWh	125kWh~215kWh
Battery voltage range	320V-864V	448V-864V
<b>AC On-grid Parameters</b>		
Grid type	3P4W	3P4W
Rated charge/discharge power	30kW	60kW
Rated grid voltage	AC400V	AC400V
Grid voltage range	-15%~+15%	-15%~+15%
Rated grid frequency	50Hz	50Hz
Frequency range	±5Hz	±5Hz
Rated current	43A	86A
Power factor	0.8 (Leading) ~0.8 (Lagging)	0.8 (Leading) ~0.8 (Lagging)
Output harmonics	≤3%	≤3%

**PRODUCT PARAMETERS**

◎ **AC Off-grid Parameters**

Rated output power	30kW	60kW
Rated output voltage	AC400V	AC400V
Rated output frequency	50Hz	50Hz
Rated current	43A	86A
Voltage accuracy	1%	1%
Frequency accuracy	0.2Hz	0.2Hz

◎ **General Parameters**

Dimension (W*H*D)	1900mm*2100mm*1230mm (BOL<125kWh, the width is 1500mm)	1900mm*2100mm*1230mm
Max. weight	2500kg	2500kg
Application	Outdoor	Outdoor
Seismic intensity rating	8 degree (IEC60980)	8 degree (IEC60980)
Anti-corrosion grade	C3	C3
Operating temperature 【1】	-20 C ~50 C	-20 C ~50 C
Relative humidity	0-95% (Non-condensing)	0-95% (Non-condensing)
Altitude 【2】	<2000m	<2000m
Cooling method	Battery room: air conditioning Electrical room: forced air cooling	Battery room: air conditioning Electrical room: forced air cooling

**PRODUCT PARAMETERS**

Noise	≤ 75dB	≤ 75dB
System efficiency	≥ 85%	≥ 85%
Fire fighting system	Automatic fire extinguishing	Automatic fire extinguishing
Fire extinguishing media	FM200	FM200
Communication interface	Ethernet	Ethernet
Communication protocols	Modbus TCP/IP	Modbus TCP/IP

◎ **Photovoltaic Side Parameters**


Maximum input module power	30kW or 60kW	60kW
MPPT voltage range	200V-850V	200V-850V
Number of MPPT paths	1	1
Number of PV input channels	1	1
Maximum input current	100A	100A


◎ **STS Static Switch (Optional)**


Rated power	60kW (Grid side 30kW, Load side 30kW)	120kW (Grid side 60kW, Load side 60kW)
Switch time	≤ 20ms	≤ 20ms

# CONTACT US NOW!

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