



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 25,000 employees and more than 100 subsidiaries around the world. There are 16 production bases in 7 provinces in China and 1 overseas 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.

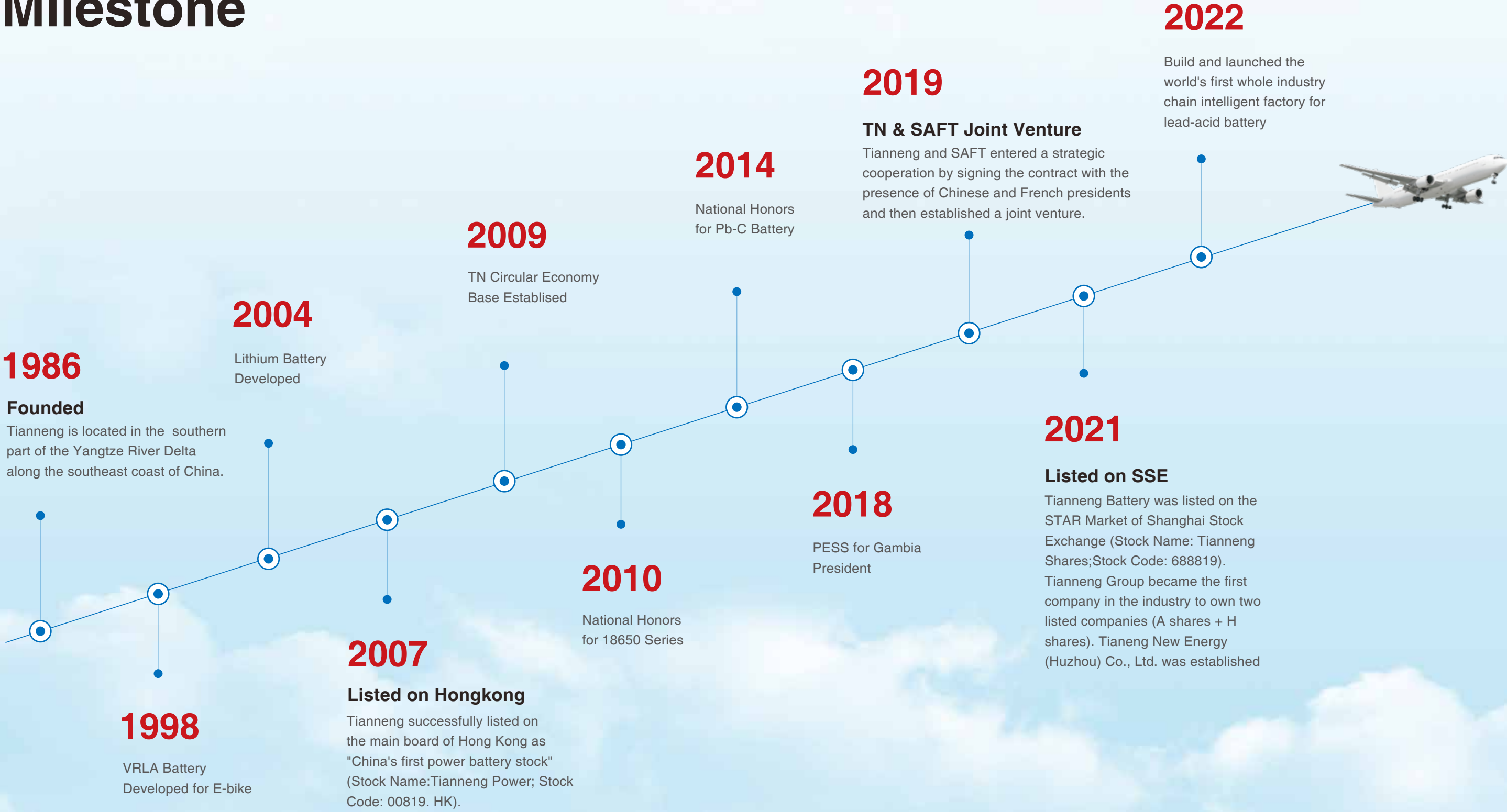
Honor:

- 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



● Headquarters ● Office ● Office & factory

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 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

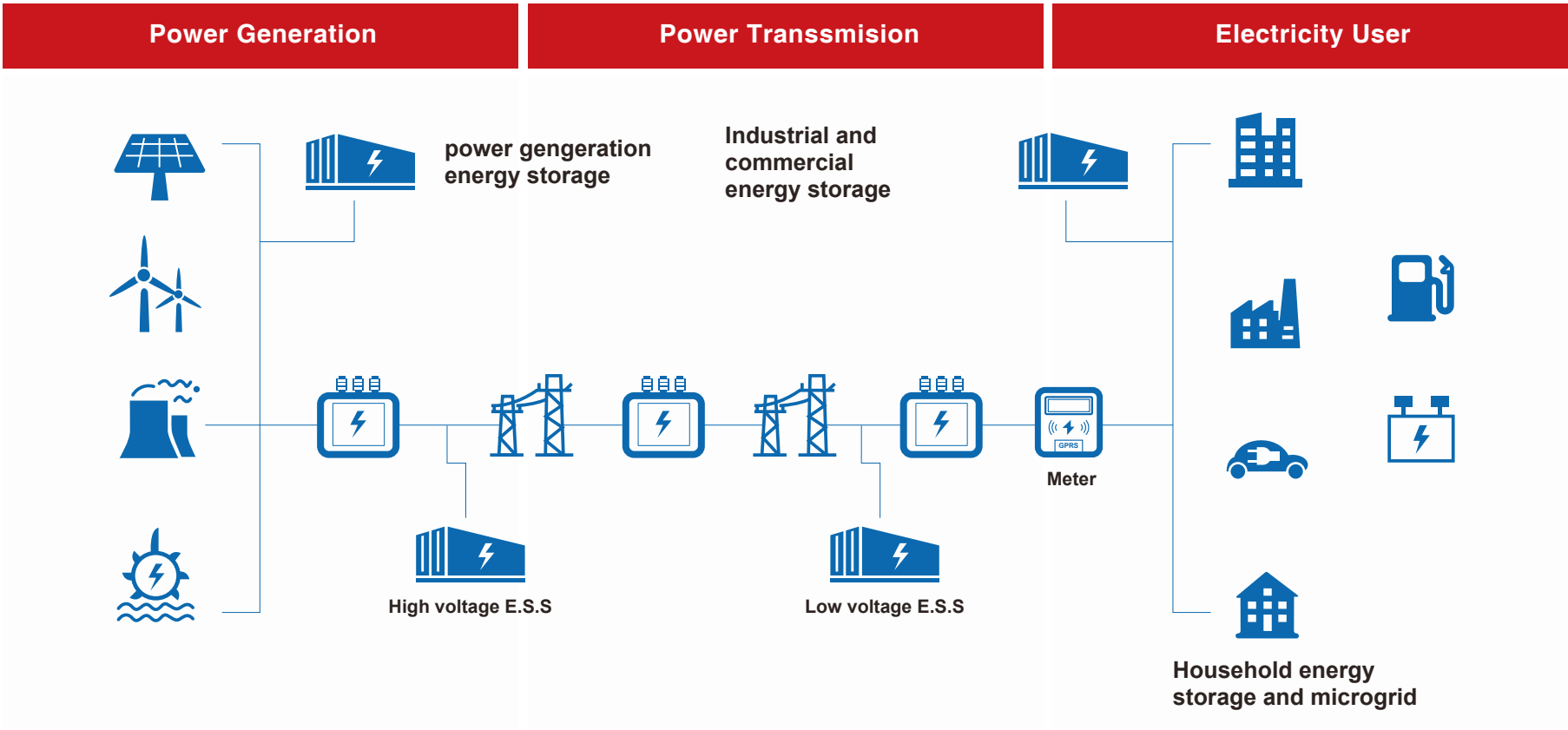
Providing intelligent and customized management through accurate battery dynamic monitoring technology.



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

Tianeng 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
Battery Module	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	
General Specification	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	
Communication	IP Rating	IP 65	
	Cell Technology	LiFePO4	
	Cycle Life	6000 @ 80% DOD, 25°C/0.5C	
	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.



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

HIGH VOLTAGE MODEL

	Model	TELiF-HESS 4850 GH
Battery Module	Single Module	51.2V 50Ah
	Battery Energy	2560 Wh
	Nominal Charge/Discharge Current	25A
	Max Charge/Discharge Current	50A
	Dimension(WxDxH)	600*210*160mm
High-voltage Box	Weight	26.5kg
	Dimension(WxDxH)	600*210*250mm
	Weight	23kg
General Specification	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
Communication	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



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LOW VOLTAGE MODEL

	Model	TELiF-HESS 48100 W	TELiF-HESS 48200 W
Performance	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
General Specification	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	
Communication	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.
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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
Performance	Specification	51.2V 100Ah
	Battery Energy	5120 Wh
	Nominal Charge/Discharge Current	50A
	Max Charge/Discharge Current	100A
General Specification	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
Communication	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.
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LOW VOLTAGE MODEL

	Model	TELiF-48150
Performance	Specification	51.2V 150Ah
	Battery Energy	7680 Wh
	Nominal Charge/Discharge Current	75A
	Max Charge/Discharge Current	150A
General Specification	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
Communication	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
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- Low self-consumption maximization
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CERTIFICATES



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- Household Energy Storage System
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- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

LOW VOLTAGE MODEL

	Model	TTLiF-48100
Performance	Specification	51.2V 100Ah
	Battery Energy	5120 Wh
	Nominal Charge/Discharge Current	50A
	Max Charge/Discharge Current	100A
General Specification	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
Communication	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.
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- Telecommunication UPS system
- Data center
- Wind&Solar power
- Industrial application

LOW VOLTAGE MODEL

	Model	TTLiF-48150
Performance	Specification	51.2V 150Ah
	Battery Energy	7680 Wh
	Nominal Charge/Discharge Current	75A
	Max Charge/Discharge Current	150A
General Specification	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
Communication	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
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- Money saving & Flexible compatibility
- Low self-consumption maximization
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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
Performance	Specification	51.2V 200Ah
	Battery Energy	10240 Wh
	Nominal Charge/Discharge Current	100A
	Max Charge/Discharge Current	200A
General Specification	Working Voltage	43.2~56.6Vdc
	Dimension(WxDxH)	445*500*244mm
	Weight	Aprox 92kg
	Installation	Rack mounted/Wall mounted/Cabinet mounted
	Charge Temperature	0°C~55°C
	Discharge Temperature	-20°C~60°C
Communication	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

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
Input (PV)						
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					
AC output						
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
Battery						
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					
EPS output						
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
General data						
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					
Display and communication						
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
PV Input (DC)			
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		
Output/Input (AC)			
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
Off grid output			
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		
Battery			
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 battery / lead-acid battery		
Communication interface	RS485 / Can		
Efficiency			
Max efficiency	98%		
European efficiency	97%		
Max discharge efficiency	95%		
MPPT efficiency	99.90%		

Model	GH5000TL	GH4600TL	GH3600TL
System			
IP inclosure	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 (Standard)		
Mechanical			
SizeL*W*H	580mm×350mm×230mm		
Install method	Wallmounted		
Weight	23.5Kg		