

TBEA



Intelligent String Liquid Cooling Energy Storage System Solution

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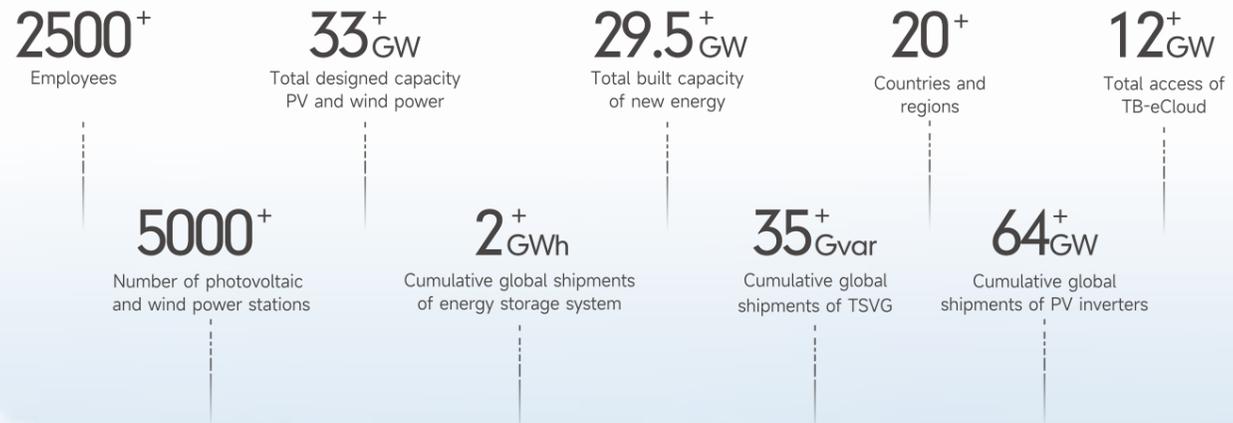
TBEA Xi'an Electric Technology Co., Ltd.

About Us

TBEA Xi'an Electric Technology Co.,Ltd. founded in 2010, is a wholly owned subsidiary of TBEA Group (Shanghai Stock: 600089), which focuses on solar power generation, battery energy storage system, PCS, new power system distribution, flexible HVDC transmission solutions and smart O&M platform services, with main products of the integrated solutions including grid-connected solar inverters, PCS, HV STATCOM, energy routers for micro-grid, flexible HVDC transmission converter valves, etc.

In the filed of PV power generation, its full range of 8kW-9000kW grid-connected solar inverters have a total installed capacity of more than 64GW globally. For battery energy storage system, the company has a 2GWh solution installation of more than 35Gvar. TBEA is also one of the first companies in China that provide complete solutions of BESS, Micro-grid, HVDC, SCADA and TB-eCloud smart O&M platform services.

With the mission of "Green Energy for Better Life", the company is dedicated to driving the sustainable development of human society by smart, efficient and green energy.

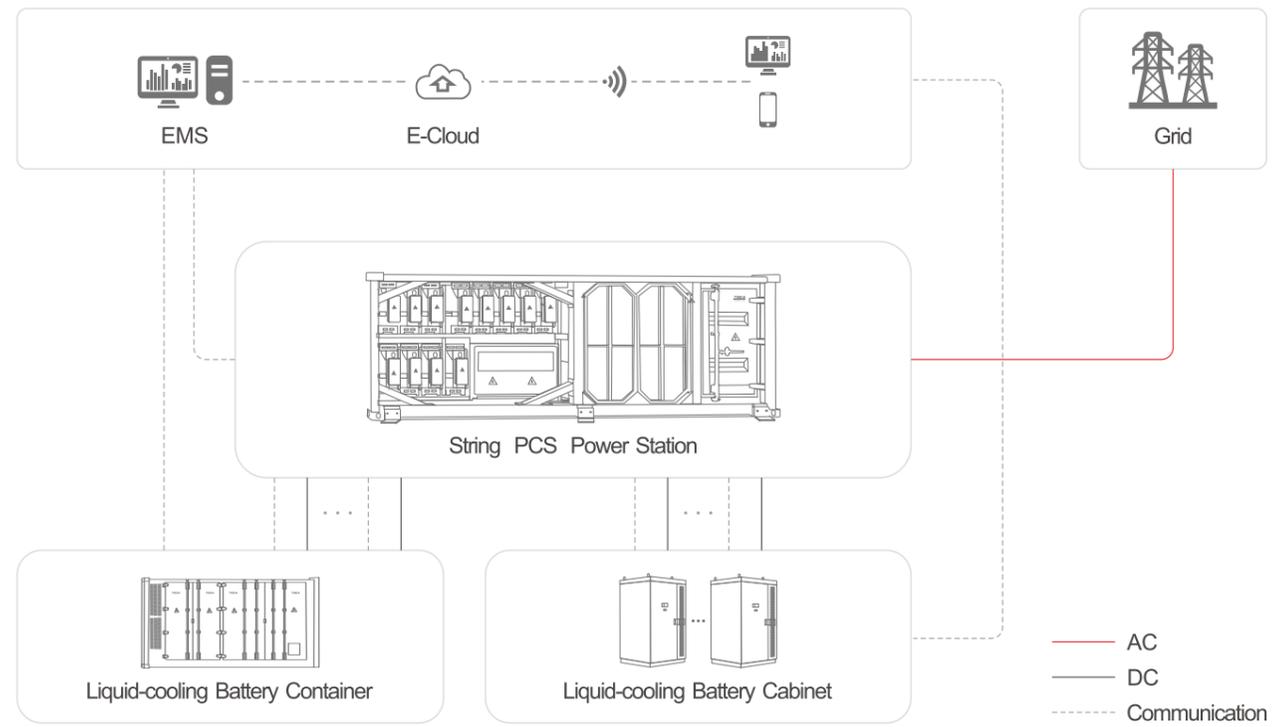


Xi'an Factory



Indian Factory

Systems Integration Solution



TBEA Value of Energy Storage System Solution



Optimal Investment

- Reducing investment
- Improving discharge capacity



Safe and Efficient

- Multi-layer security protection
- Single-cluster management



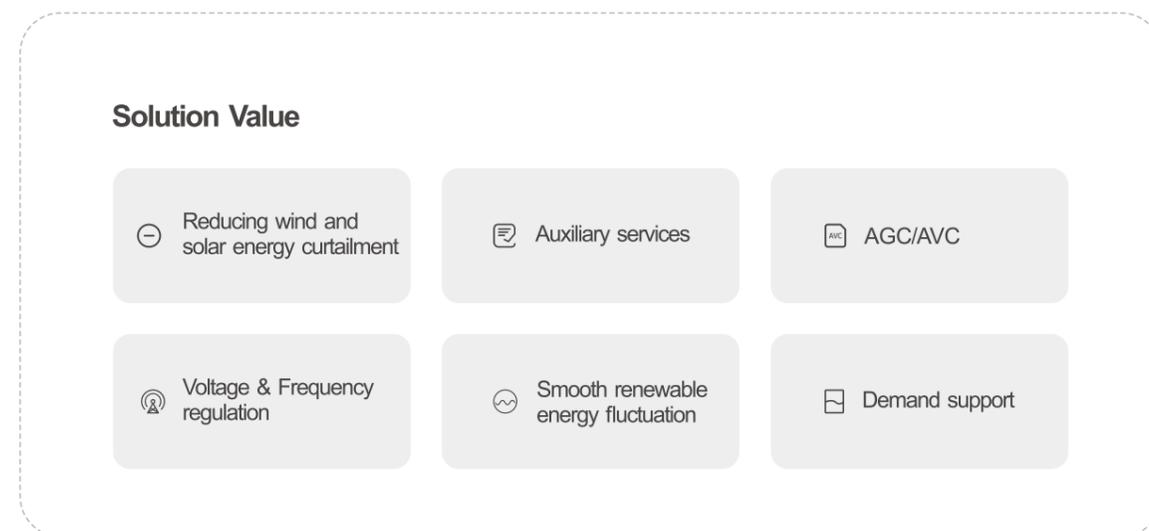
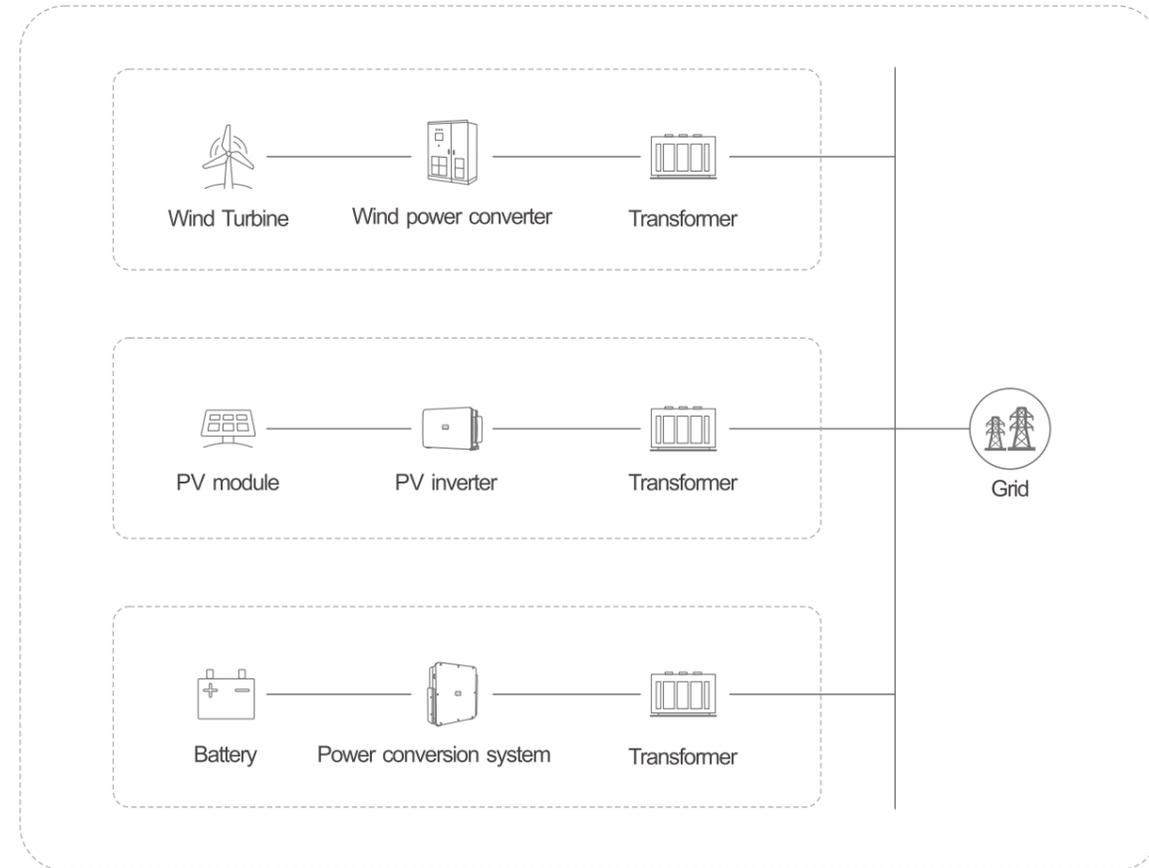
Grid Support

- Peak shaving/ Frequency regulation
- VSG / Black Start / LVRT and HVRT function

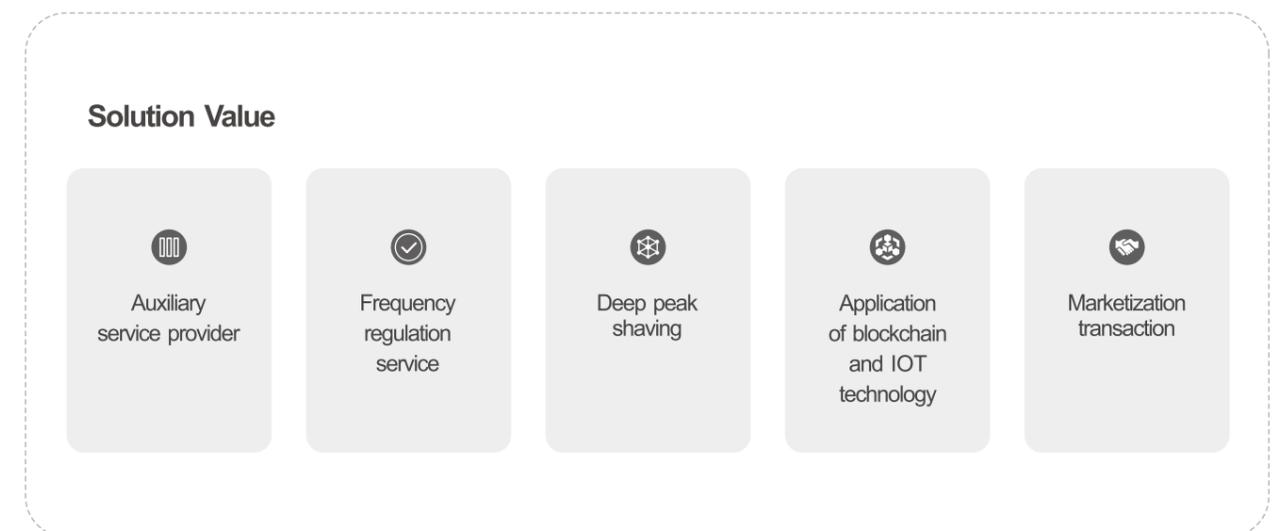
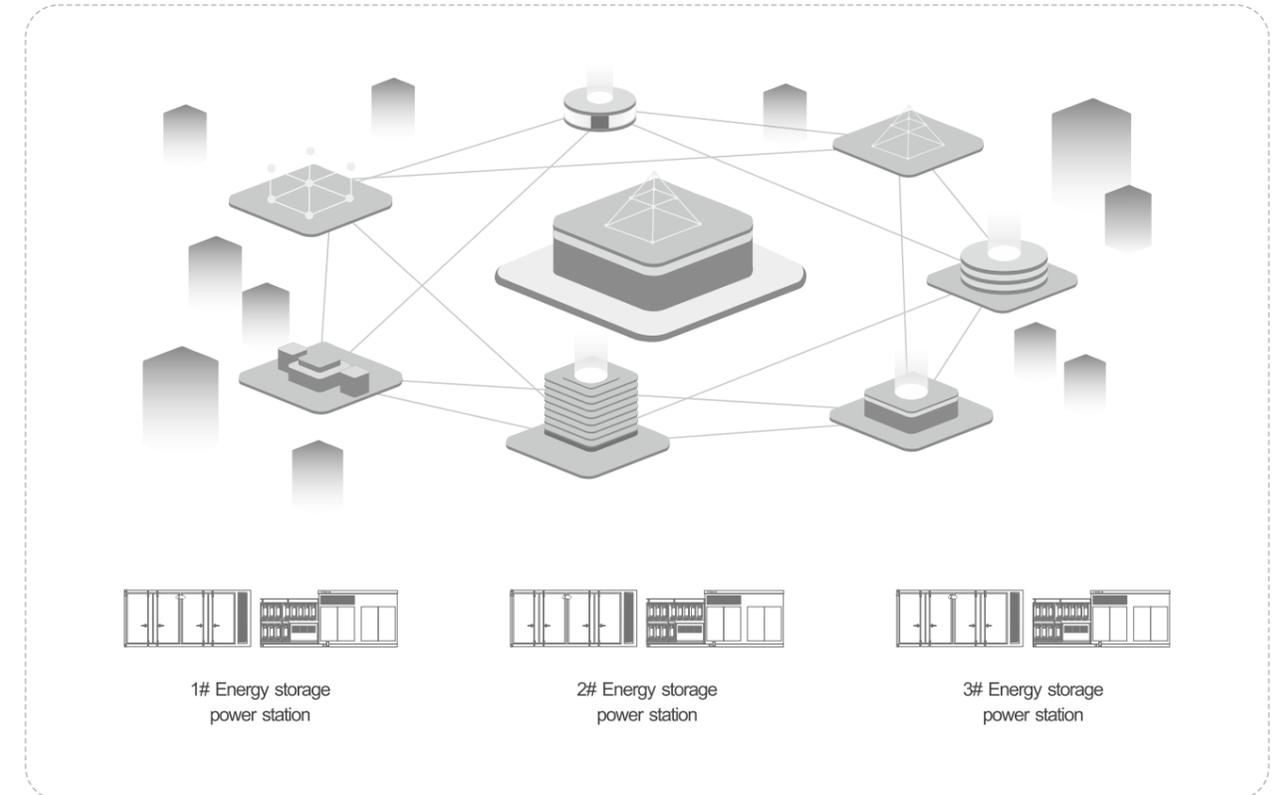


Application Scenarios

Renewable Energy + Energy Storage



Utility Energy Storage





High Reliability

- IGBT industry-leading brand
- IP66 protection, C5 anticorrosion grade
- Grid-on/off
- Grid-support function

High Availability

- High altitude adaptability
- Wide temperature adaptability
- Side maintenance chamber design, convenient installation and maintenance

High Cost-effective

- Modular cluster level management, high discharge consistency
- Three-level topology, high conversion efficiency

Technical Parameters

Product		
Specification	TE215K-HV	TE250K-HV
Efficiency		
Max. Efficiency	99.0%	
DC Side		
Max. DC Voltage	1500V	
Operating DC Voltage Range	1000-1500V	
AC Side		
Rated AC Active Power	215kW	250KW
Max. Apparent Power	236.5kVA	275KVA
Rated AC Current	180A	209A
Max. AC Current	198A	229.9A
On-grid		
Rated Grid Voltage	690V	
Allowable Grid Voltage Range	-15%~10% (settable)	
Rated AC Grid Frequency	50Hz /60Hz	
THDi	< 3% (at rated power)	
Adjustable Power Factor Range	-1 (lagging)~1 (leading)	
Off -grid		
Rated Output Voltage	690V	
THDu	< 3% (linear load)	
Rated Output Frequency	50Hz /60Hz	
System		
Cooling Method	Smart Air Cooling	
IP Rating	IP66	
Corrosion Prevention	C5	
Operating Temperature Range	-40°C~60°C (De-rating over 45°C)	
Relative Humidity	0%-95% (no condensation)	
Altitude	4000m	
Communication	RS485/CAN (MODBUS-RTU, CAN2.0B)	
Dimensions (W×H×D)	920*740*213mm	
Weight	≤98kg	
Standard	IEC62477、IEC61000	

String PCS Power Station



Flexible and Friendly

- Integrated structure, highly integrated, convenient operation and maintenance
- DC wide voltage input, flexible configuration of battery

Safe and Reliable

- Modular integration
- Single-cluster battery management, prevent overcharge and overdischarge
- Multi-machine coordinated control

Intelligent Collaboration

- Quickly suppression of frequency and power fluctuation can adapt to various application scenarios
- LVRT/HVRT, weak grid support
- VSG, Grid-forming, black start

Technical Parameters

Product			
Specification	TE2500KT	TE4300KT	TE5000KT
DC Side			
Max. DC Voltage	1500V		
Operating DC Voltage Range	1000 ~ 1500V		
Number Of DC Branches	12	20	24
Max. DC Current	236.5A*12	236.5A*20	236.5A*24
AC Side			
Rated AC Output Power	215kW*12	215kW*20	215kW*24
Max. AC Output Power	236.5kW*12	236.5kW*20	236.5kW*24
Voltage Transformation Ratio	11KV-33 kV / 0.69kV(Consult with TBEA for other voltage level)		
Rated Transformer Power	2500kVA	4300kVA	5000kVA
System			
Overload Capacity	110% overload		
Cooling Method	Smart Air Cooling		
Rated AC Grid Frequency	50/60Hz		
THD (Rated Power)	< 3%		
Adjustable Power Factor Range	-1 ~ +1		
IP Rating	IP54 / IP66 (PCS)		
Operating Temperature Range	-35°C~55°C ((De-rating over 45°C))		
Relative Humidity	0%-95% (No condensation)		
Altitude	4000m (>2000m customized)		
Communication	RS485, Ethernet , CAN , Optical Fiber		
Dimensions (W×H×D)	6058*2896*2438mm		
Weight	≤30T		

Liquid-Cooling Battery Container



🌐 Extreme Safety

- The electrical safety: a) multiple fuse protection design; b) multi-channel isolation design
- The fire protection design, four-level fire suppression strategy

⚙️ Adaptive Thermal Management

- Container integrated single-cluster water pump, temperature control strategy automatically adjusted with battery status, prolonging battery life

🔌 Independent UPS

- Container have integrated two UPS system, one is for FSS monitoring system, another one is for BMS

Technical Parameters

Energy Cell	
Capacity [Ah]	306Ah
Charge/Discharge Rate [P]	≤0.5
Nominal Voltage [V]	3.2
Rated Energy [Wh]	979.2
Cycle Life @70%	8000
Design Life [year]	20
Dimensions(W*H*D)	71.7*207.2*173.9mm

Battery Pack	
Cell Specification	LFP306Ah
Cell Number	2P52S
Nominal Capacity	101.83kWh

System	
Battery System Configuration	10P52S*8
Rated Voltage	1,331.2V
Voltage Range	1164.8V~1497.2V
Nominal Capacity	4073kWh
Cooling Method	Liquid cooling
Max. Short-Circuit Current	72.72 kA
IP Rating	IP55
Corrosion Prevention	C4 & C5(Optional)
Operating Ambient Temperature	-25°C~55°C
Storage Temperature	-30°C~60°C
Color	RAL 7042
Max. Operating Altitude	3000m
Communication Protocol	CAN, Modbus TCP/IP, RS485
Dimensions (W*H*D)	6058*2896*2438mm
Weight	35T
Testing and Certification	IEC 61000-6-2/4 IEC 62477-1, IEC 62619, EC 62933-5-2 IEC 63056 UL 1973, UL 9540, UL 9540A, CE, UK NFPA 855, NFPA 69, NFPA 70, CCS, RoHS, REACH

Energy-matrix Liquid-Cooling Battery Cabinet



Top Level Safety

- Protection level of IP56 to meet the requirements of outdoor applications
- Resistance up to C5 corrosion level, with 20-year reliability

Long Service Life

- Integrated frequency conversion liquid-cooling system, with cell temperature difference limited to 3°C, and a 33% increase of life expectancy

High Integration

- Modular design with a high energy density, saving the floor space by 50%
- Transportation after assembly, reducing on-site installation costs and commissioning time

Technical Parameters

Battery Pack	
Cell Specification	LFP306Ah
Cell Number	52
Nominal Capacity	50.92kWh

Battery Cabinet	
Pack Number	8
Battery Cluster Configuration	1P416S
Nominal Capacity	407.3kWh
Rated Charging and Discharging Power	203.67kW
Nominal Voltage	1331.2 VDC
Operating Voltage Range	1040~1500 VDC
Charge and Discharge Ratio	0.5P
Rated Current	153A
Suitable Operating Temperature of Cell	25±5°C

System	
Cooling Method	Liquid Cooling
Extinguishing Agent	Aerosol
Pack Detector	Heat, smoke, Gas
Dimensions(W×H×D)	1390mm(W)*2348mm(H)*1344.1mm(D)
Weight	3600±100 kg
IP Rating	IP56
Operating Temperature	-25°C~55°C
Relative Humidity Range	0 ~ 95 % (non-condensing)
Max. Operating Altitude	4000m
Color	Gray(RAL7035)
Fulfill Standard (Cell)	UN38.3, IEC 62619 , UL1973, UL9540A
Fulfill Standard (Container)	IEC 62619 , IEC 62477 , IEC 61000-6-2/4 , IEC63056 IEC 62933-5-2 , IEC 62281 , UL9540 , NFPA855

Application Case

ShanDong Shared Energy Storage Power Station Project -100MW/200MWh



GanSu EPC Energy Storage Power Station Project-10MW/40MWh



Inner Mongolia PV Power Plant Energy Storage Project-78MW/156MWh



GanSu 100MW PV Power Plant Energy Storage Project-15MW/60MWh



HeBei PV Power Plant Energy Storage Project-15MW/15MWh



Source-Grid-Load-Storage Project-30MW/60MWh



Application Case

100MW Wind Power Plant Energy Storage Project-10MW/20MWh



HeNan Wind Power Plant Energy Storage Project-15 MW/30MWh



HeNan 45MW Wind Power Plant Energy Storage Project -4.5MW/4.5MWh



LiXin 70MW PV Power Plant Energy Storage Project-10.5MW/21MWh



XinShang 100MW PV Power Plant Energy Storage Project-15MW/30MWh



TBEA Xi'an Energy Storage Industrial Park Energy Storage Project-1MW/1MWh

