



Energy Storage/ Micro-grid

Product Catalog



PV+ESS for the future

Stock code
002335.SZ
Parwatt Digital Energy

ABOUT US

Based on 37 years of experience in power electronic technology, parwatt has diversified solutions and rich project experience in the fields of photovoltaic, energy storage, micro-grids and integrated energy services. Together with partners in more than 100 countries and regions, parwatt is promoting the transformation of the energy structure with technology and making clean energy a force to influence the world. By 2024, Parwatt's PV installation has exceeded 56GW and its energy storage installation has exceeded 30GW/12GWh globally.

In the field of energy storage, we provide solutions for front-of-the-meter and behind-the-meter energy storage; in the field of microgrid, we have rich experience in the application scenarios of C&I parks, data centers, EV charging, and powerless/weak areas; in the field of micro-grid, we have extensive experience in the application scenarios. In the field of micro-grid, we have rich experience in C&I parks, data centers, EV charging, areas without electricity/weak electricity, and other complex application scenarios.

30GW / 12GWh **Tier 1**

global ESS installation

Energy Storage Supplier
(BloombergNEF 2024)

53.8GW+

annual solar production
capacity

NO.1

Chinese Brand PCS(>100kW)
Supplier Globally
(S&P Global 2024)

CONTENTS

BCS75K~175K-B-HM-US X2 Series 02

S-R12-P4-104S1P-L314-BG 18

BCS100K~200K-B-HM X2 Series 04

EMS Energy Management System 20

S³-EStore 06

EMS Upper Computer Software 22

BCS100K~500K-A Series 08

KM-EMS10/20 23

BCS1000K~1250K-C-HUD Series 10

KM-ECU-30 24

BCS8000K~10000K-C-HUD/T8 Series 12

BTS200~1000K-K-HUD/T Series 26

BCS1250K~1725K-B-HUD Series 14

BTS100~1000K-K/S Series 28

BCS2500K~3450K-B-HUD/T Series 16

Typical Cases 29

Modular Energy Storage Converter (DC-AC)

BCS75K~175K-B-HM-US X2 Series



Safe

- NEMA type 4X
- Balanced current conversion & Health status monitoring



Smart

- Fast power scheduling & Black start
- Support multi-module AC side parallel



Simple

- Fast Plug & Play, easy installation
- Modular design, support rack-mounted

Technical Specification

Items	BCS75K-B-HM-US X2	BCS125K-B-HM-US X2	BCS175K-B-HM-US X2
DC input			
Max. DC voltage	1500Vdc		
DC fullload voltage range	720~1450Vdc	720~1300Vdc	920~1450Vdc
Max. DC current	117A	195A	214A
Soft start	Yes		
AC output			
Rated AC output power	75kW@45°C	125kW@45°C	175kW@40°C
Rated output voltage	480Vac 3P3W	480Vac 3P3W	600Vac 3P3W
Output voltage range	-15%~10% (settable)		
Grid frequency range	60Hz		
Max. output current	99.2A	165.4A	185.2A
Power factor	>0.99 (at rated power)		
Adjustable power factor	1 (leading)~1 (lagging)		
THDi (on-grid)	<3% (at rated power)		
THDu (off-grid)	<3% (linear load)		
PCS efficiency			
Max. efficiency	98.8%		
General data			
Topology	Non-isolated		
IP rating	NEMA type 4X		
Operation temperature	-35°C~60°C/-31°F~140°F		
Relative humidity	0~100% (No-condensing)		
Cooling type	Intelligent air cooling		
Dimensions (W×H×D)	600x295x900mm/23.6x11.6x35.4in		
Weight	95kg/209.4lb		
Altitude	4000m/9843ft(>2000m/6562ft derating)		
Display	LED		
Communication protocol	Modbus-RTU, Modbus-TCP, SUNSPEC		
Communication interface	RS485, Ethernet, CAN		
Installation	Rack-mounted		
Compliance	UL 1741, CSA C22.2#107.1, IEEE 1547, IEEE 1547.1 , UL 1741 SB, CFR 47 Part 15 , ANSI C63.4		

- Specification indexes may be subject to changes without further notice.

Modular Energy Storage Converter (DC-AC)

BCS100K~200K-B-HM X2 Series



Safe

- IP66 protection
- Balanced current conversion & Health status monitoring



Smart

- Fast power scheduling & Black start
- Support multi-module AC side parallel



Simple

- Fast Plug & Play, easy installation
- Modular design, support rack-mounted

Technical Specification

Items	BCS100K-B-HM X2	BCS200K-B-HM X2
DC input		
Max. DC voltage	1000Vdc	1500Vdc
DC fullload voltage range	600~1000Vdc	1060~1450Vdc
Max. DC current	187A	212A
Soft Start	Yes	
AC output		
Rated AC output power	100kW@45°C	200kW@40°C
Max. AC output power	110kVA	220kVA
Rated output voltage	400Vac 3P3W	690Vac 3P3W
Output voltage range	-15%~10% (settable)	
Grid frequency range	50/60Hz (settable)	
Max. output current	158A	184A
Power factor	>0.99 (at rated power)	
Adjustable power factor	1 (leading)~1 (lagging)	
THDi (on-grid)	<3% (at rated power)	
THDu (off-grid)	<3% (linear load)	
PCS efficiency		
Max. efficiency	98.8%	
General data		
Topology	Non-isolated	
IP rating	IP66	
Operation temperature	-35°C~60°C	
Relative humidity	0~100% (no-condensing)	
Cooling type	Intelligent air cooling	
Dimensions (W×H×D)	600x295x900mm	
Weight	95kg	
Altitude	4000m (>2000m derating)	
Display	LED	
Communication protocol	Modbus-RTU, Modbus-TCP	
Communication interface	Ethernet, RS485, CAN	
Installation	Rack-mounted	
Compliance	IEC/EN 62477-1, EN IEC 61000-6-2/4, EN 61000-3-12, EN IEC 61000-3-11, EN 50549-1, NC RfG, VDE-AR-N 4105	IEC/EN 62477-1, EN IEC 61000-6-2/4, EN 61000-3-12, EN IEC 61000-3-11

- Specification indexes may be subject to changes without further notice.

S³-EStore C&I Energy Storage System

ESI241-100K-M



Safe

- Cell status fully monitoring & multi-level fire protection
- PCS and battery IP6X protection
- Online insulation detection & Accurate positioning protection



Smart

- Multi-mode operation & health status detection
- Refined thermal management, temperature difference within system $\leq 3^{\circ}$
- Health status recognition, Improve O&M efficiency
- Intelligent local power controlling algorithm, making full use of system energy



Simple

- High power density, only take up 1.3m²
- Flexible transportation & fast installation
- Free combination & flexible expansion

Technical Specification

Items	ESI241-100K-M
DC parameter	
Cell type/capacity	LiFePO4 3.2V/314Ah
System battery configuration	1P240S
DC protection	FUSE
System energy capacity	241kWh
System battery voltage range	600-876Vdc
P rate	≤0.5P
Depth of discharge	0-95%
Battery pack IP rating	IP67
Cooling type	Liquid cooling
AC parameter	
Rated AC power	100kW
Rated AC voltage	400Vac 3P3W+PE
AC voltage range	-15%-10%(settable)
Nominal grid frequency	50/60Hz
Nominal grid frequency range	45-55Hz/55-65Hz
THDi (on-grid)	<3% (at rated power)
THDu (off-grid)	<3% (linear load)
DC component	<0.5%
IP rating	IP66 (Modular PCS)
Cooling type	Intelligent air cooling
General data	
Max. efficiency	90.2%
Dimension (W*H*D)	1000×2340×1300mm
Weight	2300kg
IP rating	IP54
Anti-corrision grade	C3 (C5 optional)
Relative humidity	0~100% (no-condensing)
Operating temperature range	-35°C~55°C
Altitude	3000m (>2000m derating)
Anti-explosion type	Anti-explosion valve
Fire distinguish equipment	Gas aerosol
Communication interface	Ethernet/CAN/RS485
Communication protocol	Modbus TCP
Compliance	IEC/EN 62477-1, EN IEC 61000-6-2/4, IEC 62619, EN 61000-3-12, EN IEC 61000-3-11, VDE-AR-N 4105, EN 50549-1, NC RFG

- Due to the multi-supplier for some key components, the actual weight may have a +5% deviation, please refer to the actually delivered product.
- Specification indexes may be subject to changes without further notice.

1000Vdc Energy Storage Converter

BCS100K~500K-A Series



Safe

- Isolation between batteries & grid
- On-line insulation detection



Smart

- On/off grid switching time <10ms (external connection of SCR)
- Four periods of time (peak, flat, valley and sharp) price setting, flexible calculation of user profitability
- Multiple charge modes including constant current charging, equalized charging and float charging



Simple

- Clear connection panel
- Inner transformer

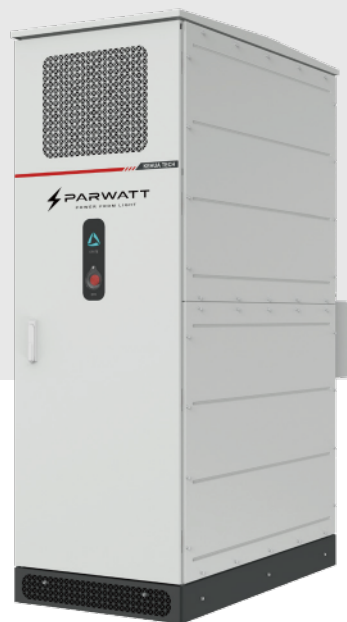
Technical Specification

Items	BCS100K-A		BCS250K-A		BCS500K-A	
DC Input						
MAX. DC voltage	1000Vdc					
DC voltage range	500~900Vdc					
Max. DC current	228A	566A		1125A		
Soft start	Yes					
AC Output (On-grid)						
Rated AC output power	100kW	250kW		500kW		
Max. AC output power	110kVA	275kVA		550kVA		
Rated output voltage	400Vac 3P4W+PE					
Output voltage range	-15%~10% (settable)					
Grid frequency range	50/60Hz (settable)					
Max. output current	159A	397A		794A		
Power factor	>0.99 (at rated power)					
Adjustable power factor	1 (leading)~1 (lagging)					
THDi	<3% (at rated power)					
AC Output (Off-grid)						
Rated AC output voltage	400Vac					
Output voltage accuracy	1%					
Max. output current	159A	397A		794A		
THDu	<3% (linear load)					
Rated output frequency	50/60Hz					
Overload capability	110% overload					
PCS efficiency						
Max. efficiency	96.40%	97.20%		97.60%		
General data						
Isolation transformer	Yes					
IP rating	IP20					
Operation temperature	-30°C~65°C (>45°C derating)			-30°C~65°C (>40°C derating)		
Relative humidity	0~95% (no-condensing)					
Cooling type	Intelligent air cooling					
Dimensions (W×H×D)	800×1800×800mm	1000×1950×800mm		1400×1950×1000mm		
Weight	730kg	1450kg		2050kg		
Altitude	5000m (>3000m derating)					
Display	Touch screen					
Communication protocol	Modbus-RTU, Modbus-TCP					
Communication interface	RS485, Ethernet(Optional)					
Compliance	IEC/EN 62477-1, EN IEC 61000-6-2/4, NC RfG,NRS 097-2-1, VDE-AR-N4110*					

- * VDE-AR-N4110 only applies to BCS250K-A and BCS500K-A models.
- * Specification indexes may be subject to changes without further notice.

1500V Energy Storage Converter

BCS1000K~1250K-C-HUD Series



Product Features



Efficient Conversions

- New three-level topology technology, maximum efficiency $\geq 99\%$
- Support 35°C 1.1 times overload, 50°C no derating
- Intelligent temperature control technology for more balanced heat dissipation



Flexible Configurations

- High power density with a footprint of only 0.95m^2
- Network ports communication, support IEC 61850 protocols
- Modular design, support multiple parallel connection



Grid Friendly

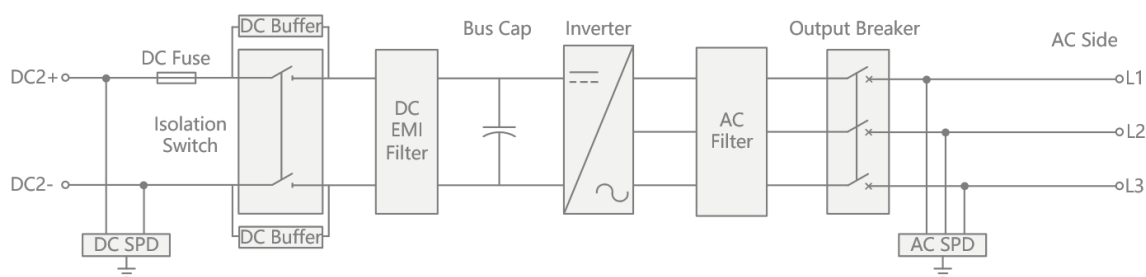
- Millisecond level response to EMS command.
- Support grid-forming function.
- Support multi-mode switching such as VSG, Black-Start, VF, PQ, etc.



Safe and reliable

- On-line insulation testing for AC and DC
- IP65 protection, support C5 corrosion protection

Circuit diagram



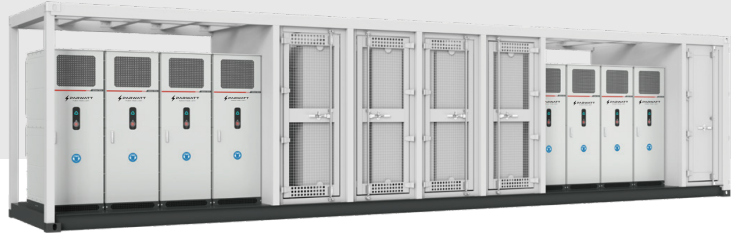
Technical Specification

Items	BCS1000K-C-HUD		BCS1250K-C-HUD	
DC input				
Max. DC voltage	1500Vdc			
Full load DC voltage range	1060~1500Vdc			
Max. DC current	1122A		1402A	
Soft start	Yes			
AC output(On-grid)				
Rated AC output power	1000kW		1250kW	
Max. AC output power	1100kVA		1375kVA	
Rated grid-tied voltage	690Vac			
Grid voltage range	-15%~10%(settable)			
Rated grid frequency	50Hz			
Max. output current	920.4A		1150.6A	
Power factor/Adjustable range	>0.99(at ratedpower)/-1(leading)~1(lagging)			
Range of reactive power	-100 % - 100 %			
THDi	<3%(at rated power)			
AC output(Off-grid)				
Rated AC output voltage	690Vac			
Output voltage accuracy	1%			
Max. output current	920.4A		1150.6A	
THDu	≤3%(liner load)			
Rated output frequency	50Hz			
Overload capability	110% overload			
PCS efficiency				
Max. efficiency	≥99%*			
General data				
Isolation mode	None			
*Dimensions (W×H×D)	735*2135*1300 mm			
*Weight	About 950kg			
IP rating	IP65			
Cooling type	Intelligent air cooling			
Altitude	4000m(>2000m derating)			
Operation temperature	-35℃ ~ 60℃ (> 50℃ derating)			
Relative humidity	0~100%(no-condensing)			
Display	LED			
Communication protocol	Modbus-RTU / Modbus-TCP / IEC61850 /IEC104			
Communication interface	RS485/CAN/Ethernet			
Compliance	EN/IEC 62477-1,EN/IEC 61000-6-2,EN50549-2/10,IEC62116,IEC61727,IEC60068-2-1/2/14/30 EN55011			

- * This efficiency value was measured in a laboratory environment.
- *Specification indexes may be subject to changes without further notice.

1500V Containerized Energy Storage & Transformer

BCS8000K~10000K-C-HUD/T8 Series



Product Features



Safe

- On-line insulation detection.
- Adapt to extreme environment, such as high temperature, salt, and extreme cold etc.
- Real-time transformer condition monitoring.



Simple

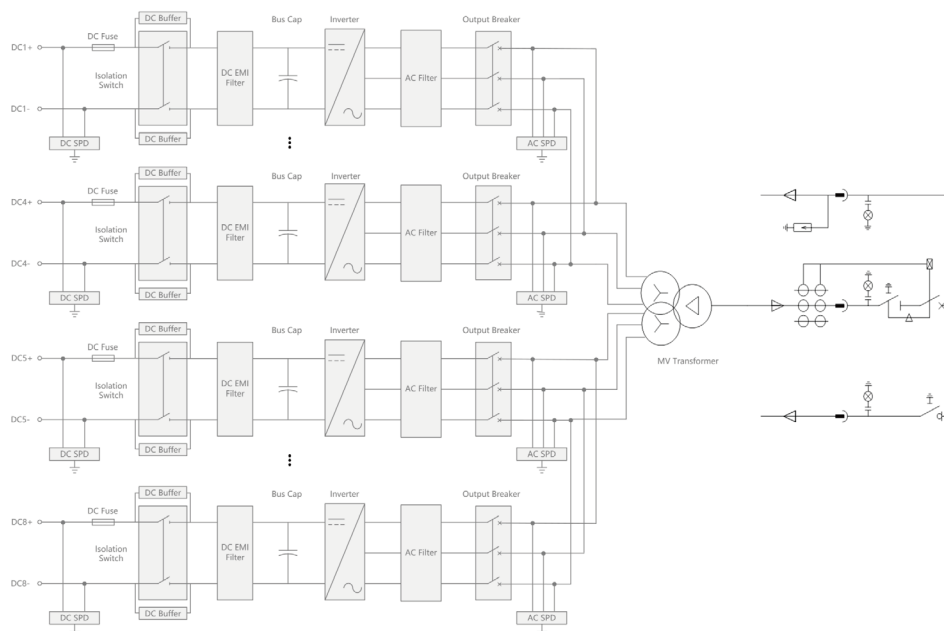
- Integrated design of converter and transformer system, integrated system, Integrated data acquisition and optic fiber network.
- Wide DC voltage operation range, flexible configuration.
- Adapt to multiple scenarios, including power generation side, grid side and user side application, supporting multi-device parallel.



Smart

- Grid forming technology, providing extra inertial support.
- Millisecond-level power response, stable power grid operation.
- Multiple functions, including Black-Start and VSG etc.

Circuit diagram



Technical Specification

Items	BCS8000K-C-HUD/T8		BCS10000K-C-HUD/T8	
DC input				
Max. DC voltage	1500Vdc			
DC voltage range	1000~1500 Vdc			
Max. DC current	1122A*8		1403A*8	
Soft start	Yes			
AC output(On-grid,Low voltage side)				
Rated AC output power	8000kW		10000kW	
Max. AC output power	8800kVA		11000kVA	
Rated grid-tied voltage	690Vac			
Grid voltage range	-15%~10%(settable)			
Rated grid frequency	50/60Hz			
Max. output current	7363A		9204A	
Power factor	>0.99(rated power)			
Adjustable power factor	1(leading)~1(lagging)			
Range of reactive power	-100 % ~ 100 %			
THDi	<3% (rated power)			
AC output(Off-grid,Low voltage side)				
Rated AC output voltage	690Vac			
Output voltage accuracy	1%			
Max. output current	7363A		9204A	
THDu	<3%(linear load)			
Rated output frequency	50/60Hz			
Overload capacity	110% overload			
PCS Efficiency				
Max. efficiency	≥99%*			
Transformer				
Rated power	8000kVA		10000kVA	
Voltage transformation ratio	0.69/35kV (Can be customized)			
Isolation type	Oil-immersed transformer			
Transformer vector	Dy11-y11			
General data				
IP rating	IP65(PCS) IP54(Skid)			
Operation temperature	-35°C~60°C(> 45°C derating)			
Relatively humidity	0~100%(no-condensing)			
Cooling type	Intelligent air cooling			
*Dimensions(W×H×D)	12192×2896×2438mm			
*Weight	<38000kg		<40000kg	
Altitude	4000m(>2000m derating)			
Display	LED			
Communication Protocol	Modbus-RTU / Modbus-TCP / IEC61850 /IEC104			
Communication Interface	RS485/CAN/Ethernet			
Compliance	EN IEC 62477-1,EN IEC 61000-6-2/4,EN50549-2/10,IEC62116,IEC61727,IEC60068-2-1/2/14/30,EN55011			

■ *This efficiency value was measured in a laboratory environment.

■ *Specification indexes may be subject to changes without further notice.

1500Vdc Energy Storage Converter

BCS1250K~1725K-B-HUD Series



Safe

- On-line insulation detection.
- Adapt to extreme environment, such as high temperature (50°C without derating), salt, and extreme cold etc.
- Noise $\leq 75\text{dBA}$, better protecting the hearing of operation and maintenance personnel.



Simple

- Efficient layout to improve space utilization.
- Secondary circuit integration, unified measurement, protection and communication.



Smart

- Support multi-machine parallel connection & black-start.
- H/LVRT function, high adaptation ability to the grid.
- Various applications such as peak shaving, frequency modulation, auxiliary grid connection for new energy system, etc.

Technical Specification

Items	BCS1250K-B-HUD		BCS1500K-B-HUD		BCS1725K-B-HUD	
DC input						
Max. DC voltage	1500Vdc					
DC voltage range	1000-1500Vdc					
Max. DC current	1403A	1683A		1936A		
Soft start	Yes					
AC output (On-grid)						
Rated AC output power	1250kW	1500kW		1725kW		
Max. AC output power	1375kVA	1650kVA		1897.5kVA		
Rated grid-tied voltage	690Vac 3P3W+PE					
Grid voltage range	-15%~10% (settable)					
Grid frequency range	50/60Hz					
Max. output current	1151A	1381A		1588A		
Power factor	>0.99 (at rated power)					
Adjustable power factor	1 (leading)~1 (lagging)					
THDi	<3% (at rated power)					
AC output (Off-grid)						
Rated AC output voltage	690Vac					
Output voltage accuracy	1%					
Max. output current	1151A	1381A		1588A		
THDu	<3% (linear load)					
Rated output frequency	50/60Hz					
Overload capability	110% overload					
PCS efficiency						
Max. efficiency	99%*					
General data						
Isolation mode	None					
IP rating	IP55					
Operation temperature	-35°C~60°C (>50°C derating)					
Relative humidity	0~100% (no-condensing)					
Cooling type	Intelligent air cooling					
Dimensions (W×H×D)	860×2270×1909mm					
Weight	1580kg					
Altitude	4000m (>2000m derating)					
Display	Touch screen					
Communication protocol	Modbus-RTU, Modbus-TCP, IEC61850, IEC104					
Communication interface	RS485, Ethernet					
Compliance	IEC EN 62477-1, EN IEC 61000-6-2/4, EN 50549-2/10,IEC 60068-2-1/2/14/30, EN 55011					

- * This efficiency value was measured in a laboratory environment.
- *Specification indexes may be subject to changes without further notice.

1500Vdc Energy Storage Converter

BCS2500K~3450K-B-HUD/T Series



Safe

- On-line insulation detection.
- Adapt to extreme environment, such as high temperature, salt, and extreme cold etc.
- Real-time transformer condition monitoring.



Smart

- Support multi-machine parallel connection & black-start.
- H/LVRT function, high adaptation ability to the grid.
- Various applications such as peak shaving, frequency modulation, auxiliary grid connection for new energy system, etc.



Simple

- Integrated data acquisition and optical fiber network, intelligent operation management.
- Efficient layout to improve space utilization.
- Integrated design of converter and transformer system to achieve the integrated delivery.

Technical Specification

Items	BCS2500K-B-HUD/T	BCS3000K-B-HUD/T	BCS3450K-B-HUD/T
DC input			
Max. DC voltage	1500Vdc		
DC voltage range	1000-1500Vdc		
Max. DC current	2806A	3367A	3872A
Soft start	Yes		
AC output (On-grid)			
Rated AC output power	2500kW	3000kW	3450kW
Max. AC output power	2750kVA	3300kVA	3795kVA
Rated grid-tied voltage	690Vac 3P3W+PE		
Grid voltage range	-15%~10% (settable)		
Grid frequency range	50/60Hz		
Max. output current	2302A	2762A	3176A
Power factor	>0.99 (at rated power)		
Adjustable power factor	1 (leading)~1 (lagging)		
THDi	<3% (at rated power)		
AC output (Off-grid)			
Rated AC output voltage	690Vac		
Output voltage accuracy	1%		
Max. output current	2302A	2762A	3176A
THDu	<3% (liner load)		
Rated output frequency	50/60Hz		
Overload capability	110% overload		
PCS efficiency			
Max. efficiency	99%*		
Transformer			
Rated power	2500kVA	3000kVA	3450kVA
Voltage transformation ratio	0.69/35kV(Can be customized)		
Isolation type	oil-immersed transformer		
General data			
IP rating	IP54		
Operation temperature	-35°C~60°C (>45°C derating)		
Relative humidity	0~100% (no-condensing)		
Cooling type	Intelligent air cooling		
Dimensions (W×H×D)	6058×2896×2438mm		
Weight	About 15000kg	About 16000kg	About 17000kg
Altitude	4000m (>2000m derating)		
Display	Touch screen (optional)		
Communication protocol	Modbus-RTU, Modbus-TCP, IEC61850, IEC104		
Communication interface	RS485, Ethernet		
Compliance	IEC EN 62477-1, EN IEC 61000-6-2, EN 50549-2, NC RfG, IEC 62116, IEC 61727		

- * This efficiency value was measured in a laboratory environment.
- * Specification indexes may be subject to changes without further notice.

S³-EStation 5MWh Liquid-cooled Battery System



Product Feature



Safe

- Enclosure IP55 & C5
- IEEE693 Standard, applicable to high-intensity seismic regions
- Multi-level disconnections for DC circuit



Smart

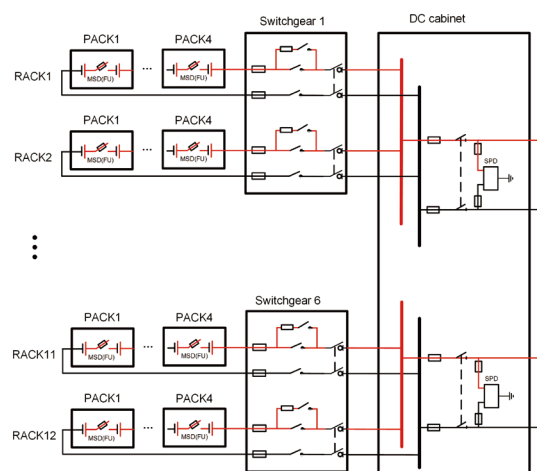
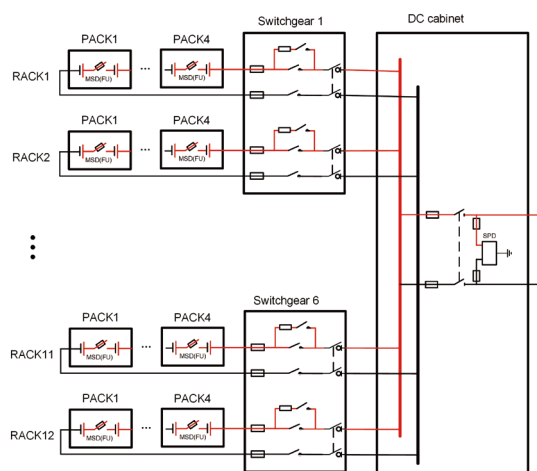
- Intelligent temperature control, temperature difference within container <3°C
- PCS、BMS、EMS linkage design, whole process monitoring and management
- Level 5 fire protection system integrated with detection, explosion-proof control, explosion relief and fire extinguishing.



Simple

- Modularized design, simplifying deployment
- Battery pre-installation, integrated equipment shipment
- Fast configuration, one-key networking and upgrading

Electrical diagram



Technical Parameter

Product Model	P104S1PL314B (Battery Pack)
Basic Parameters	
Standard charge/discharge ratio	0.5P
Combination mode	1P104S
Rated Energy	104.5kWh
Nominal Voltage	332.8V(Range: 260V~379.6V)
Thermal Management mode	Liquid-cooled
Single PACK Cell Temperature Difference	≤ 2℃
Battery Charge/Discharge operating temperature	0℃ ~55℃ /-20℃ ~55℃
Storage Temperature	0~35℃ /-40℃ ~55℃ (within 1 month)
Dimensions (W*H*D)	779×250×2150.5mm
Weight	690kg
Storage Humidity	< 95%(no condensation)
Maximum Operating Altitude	3000m

Product Model	RP4104S1PL314BG (Battery Rack)
Basic Parameters	
Standard charge/discharge ratio	0.5P
Combination mode	1P416S
Rated Energy	418kWh
Nominal Voltage	1331.2V(Range: 1040V~1500V)
Thermal Management mode	Liquid-cooled
Communication mode	CAN
Battery Charge/Discharge operating temperature	0℃ ~55℃ /-20℃ ~55℃
Storage Temperature	0~35℃ /-40℃ ~55℃ (within 1 month)
Dimensions (W*H*D)	990×1339×2151mm
Weight	2900kg
Storage Humidity	< 95%(no condensation)
Maximum Operating Altitude	3000m

Product Model	SR12-P4104S1PL314BG-A2 (Battery System)	SR12-P4104S1PL314BG-B1 (Battery System)
Basic Parameters		
Standard charge/discharge ratio	0.5P	0.25P
Combination mode	12P416S	
Rated Energy	5015 kWh	
Nominal Voltage	1331.2V(Range: 1040V~1500V)	
Thermal Management mode	Liquid-cooled	
Fire-fighting systems (battery containers)	Hot aerosol	
IP rating	IP55	
Communication mode	CAN/RS485/LAN	
Battery Charge/Discharge operating temperature	0℃ ~55℃ /-20℃ ~55℃	
Storage Temperature	0~35℃ /-40℃ ~55℃ (within 1 month)	
Dimensions (W*H*D)	6058×2896×2438mm	
Weight	≤ 44.5T	
Storage Humidity	< 95%(no condensation)	
Maximum Operating Altitude	3000m	

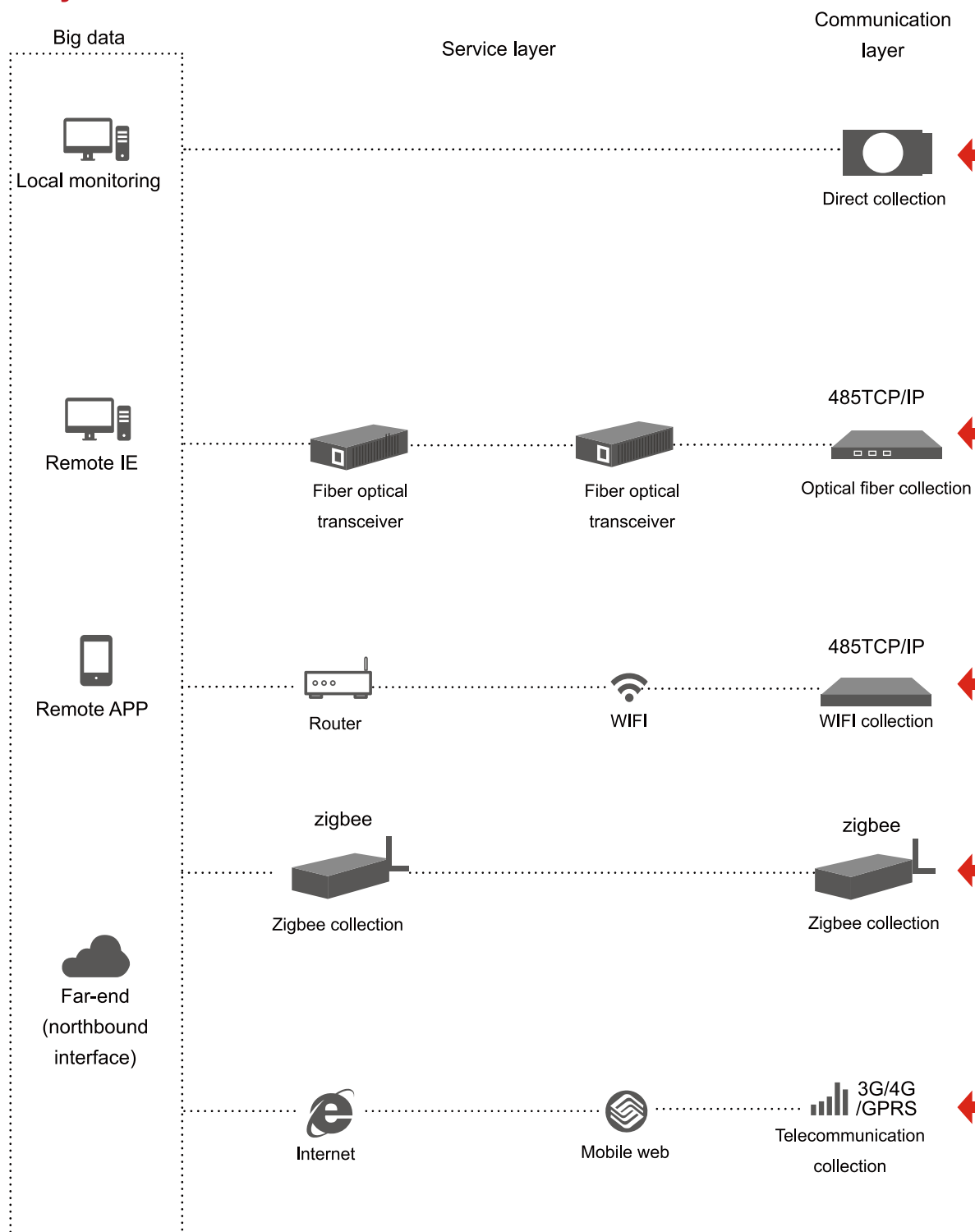
*Reference only, subject to project product drawings

■ The specifications are subject to change without prior notice.

EMS Energy Management System

EMS energy management system can realize the functions of monitoring, controlling and power distribution for multiple sets of energy storage units. It can meet the needs of big data and cross-platform access, and rapid collection, mining and analysis of massive data. Safe, stable and efficient operation of the whole energy storage system is realized.

System Architecture



Mechanical floor



UPS



Energy storage
converter



Electricity meter



Convergence
box



Inverter



PV arrays



Weather
instrument



Box-type
transformer
substation



Other devices

Application scenarios

- Management of power energy jointly generated through wind, light and storage
- Energy storage, frequency modulation and power control
- Comprehensive energy management in Smart Park
- Energy management of micro-grid system
- Off-grid/ island
- Reactive power regulation
- Dispatching target tracking
- Capacity control

System features

- System data capacity and functional modules are supported to be extended and added
- The distributed design is adopted and unattended operation, self-healing after failure and other functions are supported with the improvement of the system reliability
- With flexible deployment centralized/distributed deployment and single/dual redundant deployment are supported
- Flexible configuration of the system is supported, and the system configuration can be quickly adjusted with the reduction of debugging cycle

EMS Upper Computer Software

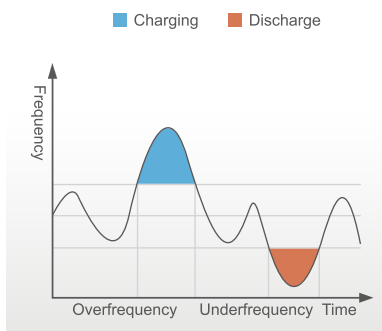
PowerSCADA3000

- The system adopts the non-relational timing sequence database as the history banks to quickly retrieve and build a whole view of fault recurrence
- HMI adopts the plug-in type technology and supports more complex basic graphic elements, such as curve graph/bar graph/pie chart/ hydrograph /instrument panel, etc.
- Javascript graphic design is adopted, balancing the system and the increasingly changed personalized needs
- The client HMI and Web publishing are supported

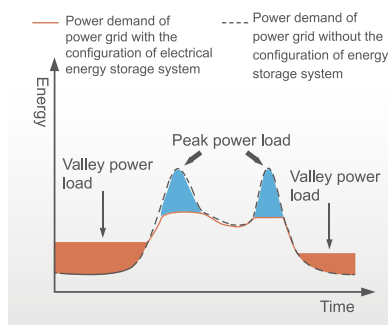


Major function

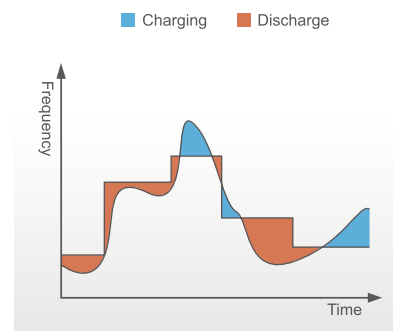
Frequency adjustment



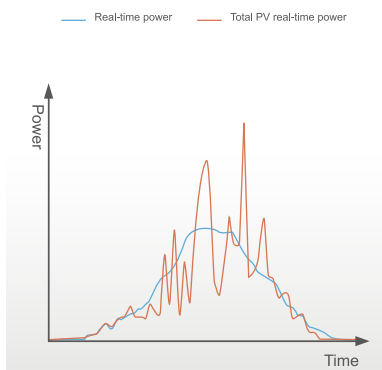
Peak shaving



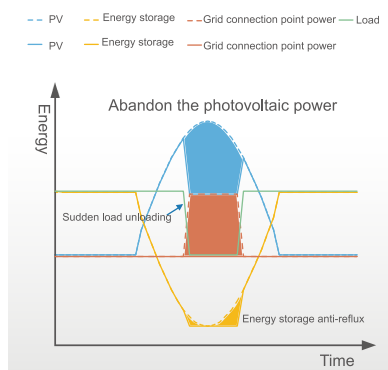
Correction of the generation plan curve



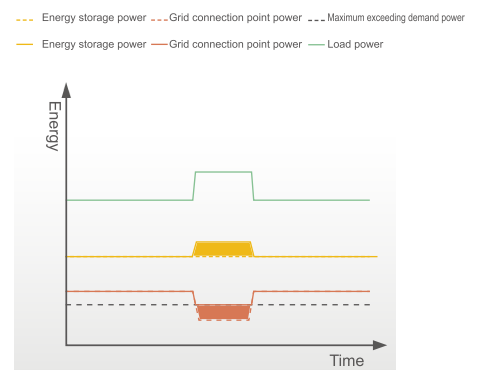
Smooth output



Anti-reflux

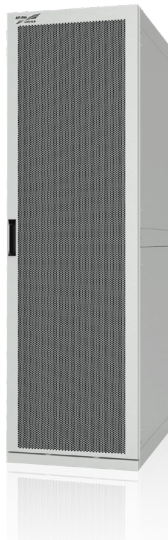


Anti-exceeding demand



EMS Cabinet

KM-EMS10/20



Product features

- Rack-mounted hardware design, standardized software design and customized scheme design
- Support a variety of mainstream operating systems (Linux CentOS7.0, Windows 10, Windows Server2016)
- Support multiple communication modes (CAN, 485, Ethernet, etc.)
- Support a variety of mainstream communication protocols (IEC61850, Modbus, IEC60870-5, DNP, etc.)

Technical Specification

Voltage	AC: 176-295Vac/50Hz	
Power consumption	≤1000W	
Server	Industrial personal computer/server	
Switch	Layer-2 switch	
Monitoring software	PowerSCADA3000	
Serial port server	RTU/TCP gateway	
Protocol converter	Optional	
UPS	3kVA	
Communication Interface	Ethernet, optical fiber, RS485	
Communication protocol	Modbus RTU/TCP, IEC101, IEC104, DLT645, CDT	
Protection class	IP20	
Pollution level	2	
Operating temperature	-15-60℃	0-40℃
Operating humidity	0-85% (no-condensing)	
Dimension (H×W×D)	2000×600×800mm	2000×600×1000mm

- * Specification indexes may be subject to changes without further notice.

KM-ECU-30

Flexible networking

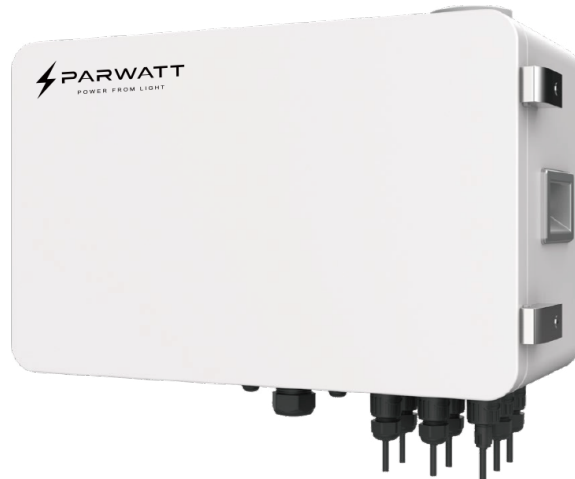
- Industrial-grade large database, second-level storage and core-level data diagnosis and analysis
- Compatible with mainstream operating systems, supporting cross-platform rapid network deployment
- Support Ethernet, RS485, WIFI and other communication modes

Optimised scheduling

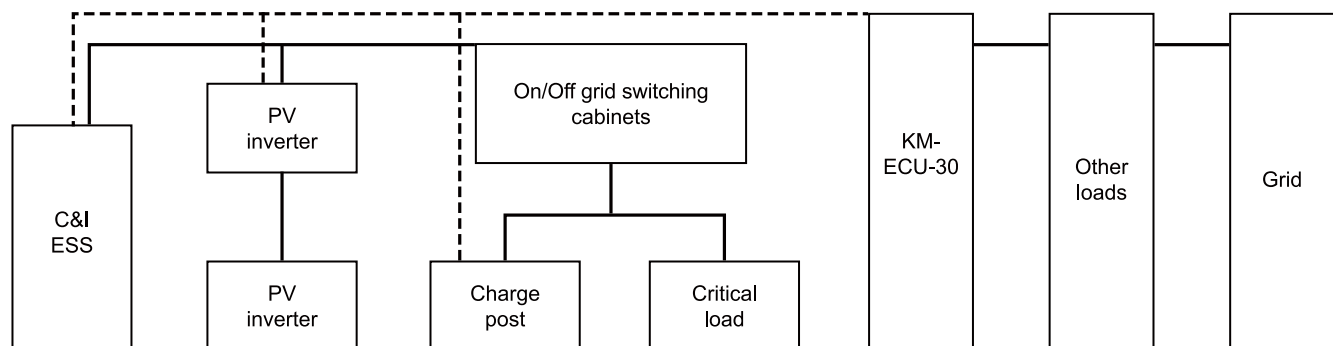
- AI linear planning, particle swarm algorithm automatically generates the optimal charging and discharging curve
- Real-time energy monitoring and data collection, support for abnormal detection and early warning
- Intelligent scheduling strategy, support for equipment co-control and linkage management

Easy O&M

- IP65 protection, wall-mounted installation, space-saving and easy to operate
- Supports one-key upgrade of station equipment, reducing customer service manpower investment
- Graphical interface, intuitive operation, saving daily maintenance costs



Circuit diagram



— Power line

- - Communication line

Technical Specification

Items	KM-ECU-30
Number of Access Units	≤10
Communication parameters	
ESS LAN interface	10 independent 100M network ports
RS485 interface	4
Northbound LAN interface	2 independent 100M network ports
Wireless communications	WIFI
Power supply	
DC power supply	24Vdc±10%, 1A
AC power supply	195-264Vac, 0.1A
Working environment	
Working environment temperature	-35~55°C
Storage environment temperature	-40~70°C
Relative humidity	0~100% (nocondensation)
System parameter	
Dimensions (W×H×D)	550×350×250mm
Weights	23kg
Display	WEB
Installation	wall-mounted
Inlet method	bottom in and bottom out
Anti-corrsion grade	C3 (C5 optional)
Protection class	IP65
Function	
Basic functions	Human-machine interactive interface, intelligent alarm, data report, power analysis, revenue statistics, equipment management, system management
Side-end control	Peak and valley arbitrage, demand management, anti-reverse flow, SOC equalisation, SOC backup, power allocation

- Specification indexes may be subject to changes without further notice.

On/Off-grid Switching Cabinet

BTS200~1000K-K-HUD/T Series



Applicable system

- Automatic on/off grid switching for energy storage system of 100kW-500kW
- C&I energy storage system for user side
- System with peak load shifting and emergency power requirements

Product features

- Millisecond level (100ms) automatic micro-grid forming when Grid fault occurs
- Manual operation mode, achieving necessary operation for experiment and switching control fault
- Bottom in top out thermal system, reducing the water leakage risk in raining days

Technical Specification

Items	BTS200K-K-HUD/T	BTS600K-K-HUD/T	BTS1000K-K-HUD/T
System parameter			
Grid capacity	200KVA	600KVA	1000KVA
Transformer power	100KW	300KW	500KW
Maximum load-side AC power	110KW	330KW	550KW
Maximum AC power on storage side	110KW (@400Vac)	330KW (@400Vac)	550KW (@400Vac)
Access Capacity	ESS ≤1 unit	ESS ≤3 unit	ESS ≤5 unit
Switch Selection	Contactor type		
Switching time	<100ms		
Permissible grid voltage range	360~440Vac		
Rated grid voltage	400Vac		
Frequency	50Hz		
Wiring Method	3W+PE+N		
Efficiency	97%		
Working environment			
Maximum working altitude	3000m (>2000m derating)		
Working environment temperature	-35~55°C		
Working humidity range	0~100%(no condensation)		
System storage temperature range	-40~70°C		
Mechanical parameters			
Weights (T)	1.5	1.8	2.3
Dimensions (D*W*H)	1200*1300*2340mm		
Communication protocols	MODBUS TCP/ IEC104/61850		
Inlet method bottom in and bottom out	Inlet method bottom in and bottom out		
Safeguard	EPO/Over-temperature protection		
Anti-corrsion grade	C3(C5 optional)		
Protection class	IP55		
Cooling method	Air cooling		

- Specification indexes may be subject to changes without further notice.

On/Off-grid Switching Cabinet

BTS100~1000K-K/S Series

Applicable system

- Small microgrid system
- User side commercial energy storage system
- Dual demand system of peak load shifting and emergency power supply

Product features

- Quickly separate the system from the power grid (switching time < 10ms)
- No need for additional configuration of microgrid system controls, reducing additional investment
- With manual control mode, operation control necessary for various experiments and switching control failures
- There are two switching speed options (< 10ms and < 200ms)
- With cooling system with Kehua's proprietary technology ensures the reliability of the system in various applications

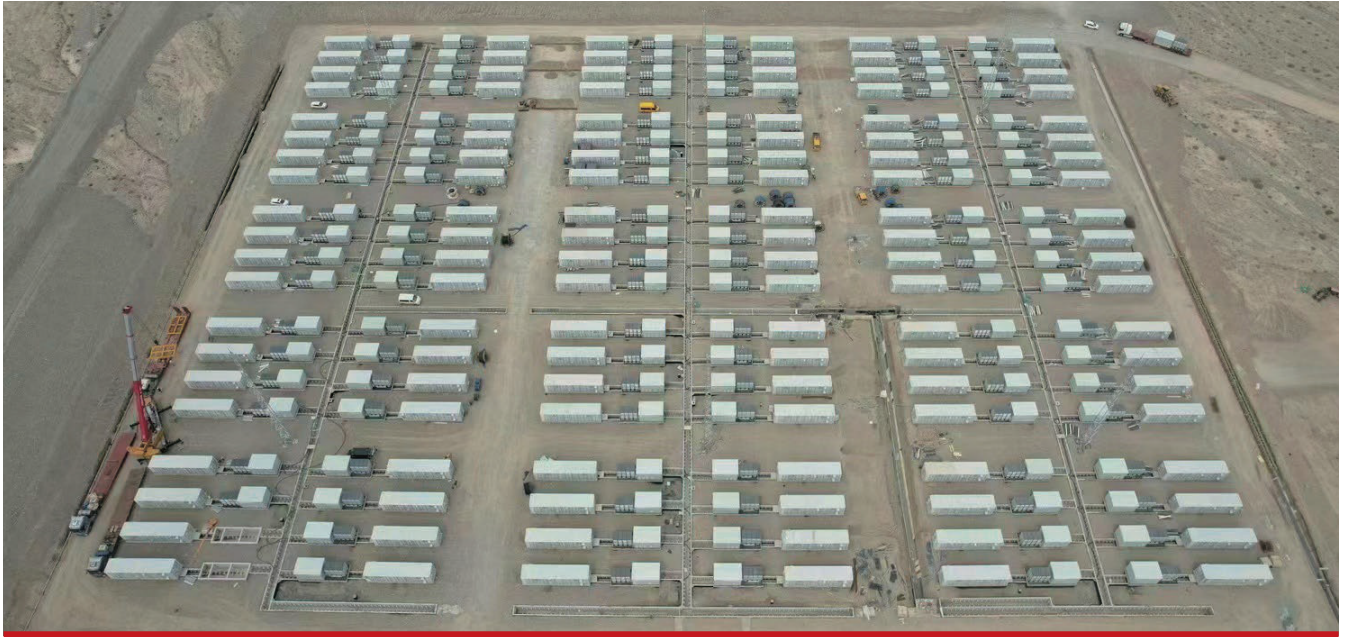


Technical Specification

Items	BTS-100K-K/S	BTS-200K-K/S	BTS-500K-K/S	BTS-1000K-K/S
Maximum AC power	100kVA	200kVA	500kVA	1000kVA
Maximum AC current	144A	289A	722A	1444A
Rated grid voltage	400Vac			
Grid voltage range	300~500Vac			
IP rating	IP 20			
Switch selection	BTS-K (Contactor version), BTS-S (SCR version)			
Switch time	<200ms (Contactor version), <10ms (SCR version)			
Operating temperature range	-25°C ~55°C			
Relative humidity	0~95% (no-condensing)			
Protection	Overtemperature, overcurrent, short circuit, lightning protection, etc.			
Altitude	5000mm (>3000m derating)			
Dimensions (W×H×D)	800×1800×800mm	800×2000×800mm		800×2000×1000mm

- Specification indexes may be subject to changes without further notice.

Typical Cases



300 MW/1200 MWh Grid-forming Energy Storage Project in China
The world's largest grid-forming energy storage project

■ September 2024



33.5 MW/67 MWh Large-scale Energy Storage Project in Brazil
Brazil's largest energy storage project

■ December 2022

Typical Cases



27.6 MW/55 MWh Energy Storage Project in Bulgaria
By 2024, Bulgaria's largest energy storage project

■ Jun 2024



100 MW/200 MWh Co-Located Energy Storage Station in Ningdong Town,
Ningxia Hui Autonomous Region

Typical Cases



1 MW Energy Storage Project in Europe
Located deep in the mountain

■ 2021



1 MW Energy Storage Project in Europe

Renewable Energy / C&I ESS



C&I PV+ESS Solution in Netherlands



10MW Energy Storage Application in Bahamas

Renewable Energy / C&I ESS



10 MWh C&I Energy Storage Project in Mexico



Energy Storage + Machinery Manufacturing

Reliable • Flexible • Responsible

Parwatt Digital Energy

Address: Unit 1401-5, No. 53 Chengyi North Street, Phase III, Software Park,
Torch High-tech Zone,Xiamen,Fujian,China
Email: jacky@parwattparts.com
Cellphone: +86 137 7998 3942
WhatsApp: +86 137 7998 3942
WeChat: +86 137 7998 3942
www.parwattparts.com

Copyright @Kehua Digital Energy All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Parwatt Digital Energy

General Disclaimer

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer or an acceptance. Parwatt may change the information at any time without notice.

Version NO.: 20250725