

KSTAR

Energy Storage Solution

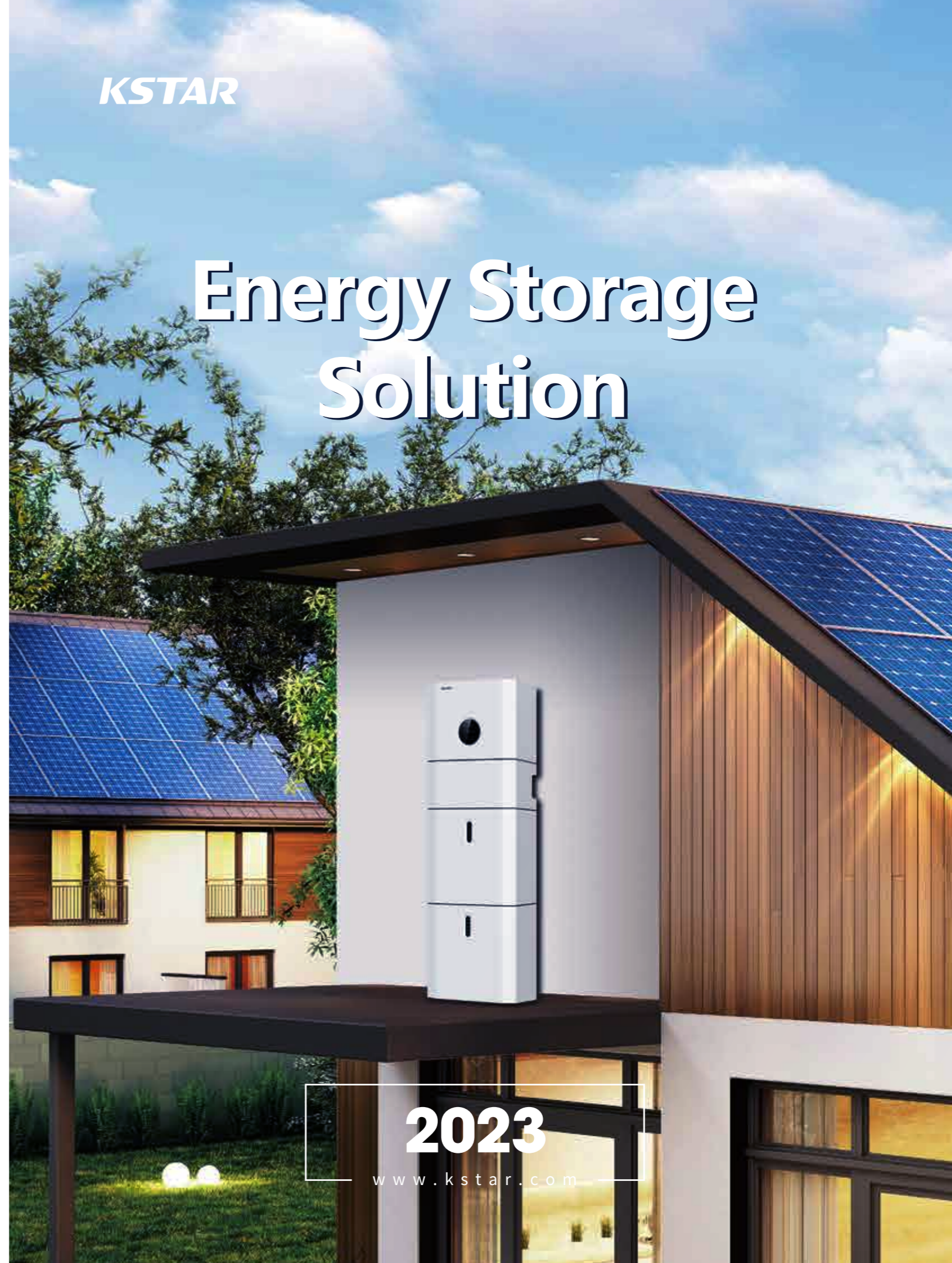
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KSTAR Powering a green future

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2023
www.kstar.com

About KSTAR



► TECHNOLOGY, INNOVATION AND THE HISTORICAL INDUSTRIAL EXPERIENCE OF KSTAR FROM TODAY AVAILABLE FOR EVERY HOME

Founded in 1993, Shenzhen KSTAR Science & Technology Co., Ltd (Stock Code:002518) is a National Torch Plan Key High-tech Enterprise, and also a pioneer of UPS industry and a total solution provider for Data Center Critical Infrastructure & PV Inverter Systems in Mainland China.

KSTAR is fully committed to the R&D and has been providing high-quality products with full service to over 90 countries and regions worldwide, leading the industrial development with innovation.

► Office and service center globally





Residential All in one ESS

BluE-S 3.68kW/5kW
E10KT 10kW



CATL LFP Battery



Modular Design



Convenient & Light



Type II SPD



Built-in EPS



API / VPP Ready

All In One Residential ESS CATL Battery Solutions



Safety



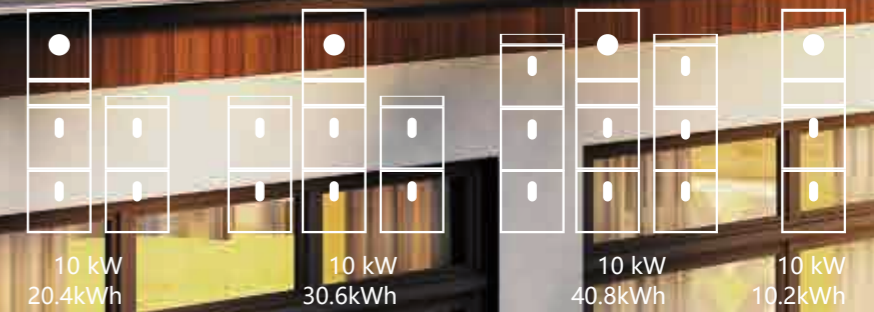
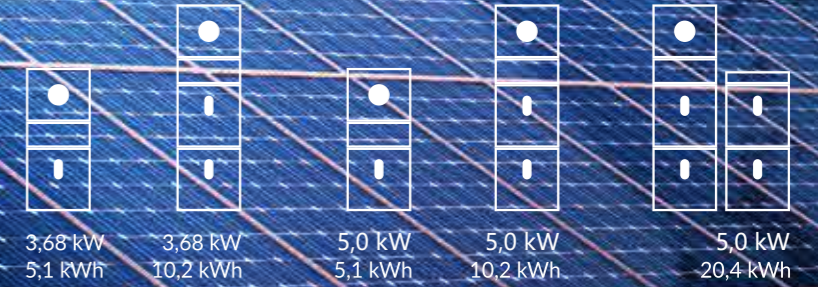
Simple



Adaptable



Efficient





KAC Series PCS BC100DE Battery

Expandable to
1MW / 2MWh Ongrid
500kW / 1MWh Offgrid



Modular Design



Flexible Configuration



Convenient & Light



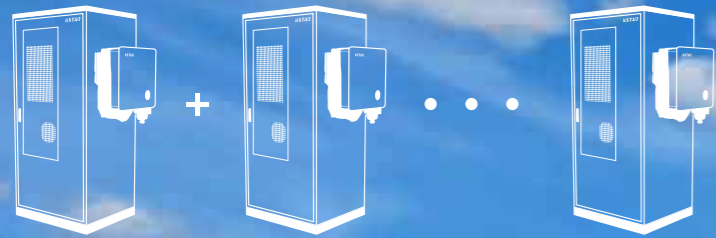
Type II SPD



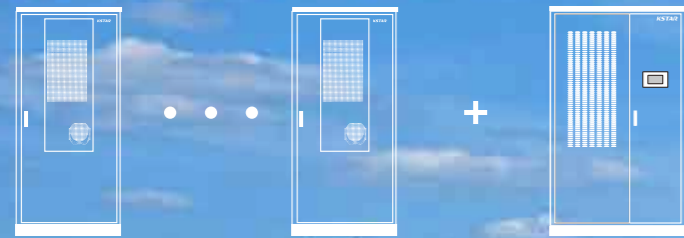
LVRT/HVRT Ability



Built-in EMS









20 in parallel, 1MW/2MWh



250KW/500kWh

All In One C&I Energy Storage System CATL Battery Solutions

-  **Peaking shaving**
-  **Time of Use**
-  **Self consumption**
-  **Demand control**
-  **Battery priority**
-  **Export limitation**



BluE Residential ESS

All In One Energy Storage System
CATL Battery Solutions



CATL LFP Battery, stable and safe
Module, pack, system, triple protection
IP65, outdoor installation, away from living room



Modular design, single person can carry and
install it. Plug and play, 30 min quick installation
Space saving; 0.15 sq. m foot print



Global cloud platform & Mobile APP
anytime and any where
Open API, support power internet applications

Battery Model		BluE-PACK5.1	
Physical		Operation	
Battery Type	LFP (LiFePO4)	Max. Charge/Discharge Current	50A/80A
Weight	54KG	Rated DC power	4096W
Dimension (W x H x D)	540*490*240mm	Max. Charge/Discharge Power	2825W/4096W
IP Protection	IP65	Operating Temperature Range	-10 to 50°C charging -10 to 50°C discharging
Warranty	5 Year Product Warranty, 10 Year Performance Warranty	Humidity	0~95% (No condensation)
Electrical		BMS	
Energy Capacity	5.12kwh	Modules Connection	Max. 4
Usable Capacity	4.6kwh	Capacity	100-400Ah
Depth of Discharge (DoD)	90%	Power Consumption	<2W
Nominal Voltage	51.2V	Communication	CAN & RS485
DC Circuit Breaker	125A	Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature measurement
Operating Voltage Range	44.8-56.5V	Certificate	
Internal Resistance	<20mΩ	Safety(Cell)	Pack: IEC/EN 62619;UN38.3 Cell: IEC/EN 62619;UN38.3;UL1973
Cycle Life	10000cycle		

*Maximum 4 battery pack in parallel.

Hybrid Inverter Model	BluE-S 3680D-M1	BluE-S 5000D-M1
PV String Input		
Max. DC Voltage	580V	580V
Nominal Voltage	400V	400V
MPPT Voltage Range	80V-560V	80V-560V
Start Voltage ³	150V	150V
Number of MPPT	2	2
Strings Per MPPT	1	1
Max. Input Current Per MPPT	15A	15A
Max. Short-circuit Current Per MPPT	18A	18A
AC Output (Grid)		
Nominal AC Output Power	3680W	5000W
Max. AC Apparent Power	7360VA (From Grid)	7360VA (From Grid)
Max. AC Output Power	3680W	5000W ¹
Nominal AC Voltage	230Vac	230Vac
AC Grid Frequency Range	50 / 60Hz±5Hz	50 / 60Hz±5Hz
Max. Output Current	16A	22A ²
Max. Input Current	32A	32A
Power Factor (cosΦ)	0.8Leading-0.8Lagging	0.8Leading-0.8Lagging
THDi	<3%	<3%
Battery Input		
Battery Type	LFP (LiFePO4)	LFP (LiFePO4)
Nominal Battery Voltage	48V	48V
Charging Voltage Range	40-60V	40-60V
Max. Charging Current	50A	100A
Max. Discharging Current	80A	100A
Battery Capacity	100-400Ah	100-400Ah
Charging Strategy for Li-ion Battery	Depend On the BMS	Depend On the BMS
AC Output (Backup)		
Max. Output Apparent Power	4000VA	5000VA
Peak Output Apparent Power	6900VA 10sec	6900VA 10sec
Max. Output Current	16A	20A
Nominal Output Voltage	230V	230V
Nominal Output Frequency	50/60Hz	50/60Hz
Output THDv (@Linear Load)	<3% (Linear Load)	<3% (Linear Load)
Efficiency		
Max. PV Efficiency	97.6%	97.6%
Euro. PV Efficiency	97.0%	97.0%
Protection		
DC Switch	Bipolar DC Switch (125A/Pole)	Bipolar DC Switch (125A/Pole)
Anti-islanding Protection	Yes	Yes
Output Over Current Protection	Yes	Yes
DC Reverse Polarity Protection	Yes	Yes
String Fault Detection	Yes	Yes
DC/AC Surge Protection	DC Type II;AC Type III	DC Type II;AC Type III
Insulation Detection	Yes	Yes
AC Short Circuit Protection	Yes	Yes
General Specifications		
Dimensions W x H x D	540*590*240mm	
Weight	32kg	
Operating Temperature Range	-25°C~+60°C	
Noise (dB)	<25	
Cooling Type	Natural Convection	
Max. Operating Altitude	2000m	
Operating Humidity	0~95% (No Condensation)	
IP Class	IP65	
Topology	Battery Isolation	
Communication	RS485/CAN2.0/WIFI/4G	
Display	LCD/APP	
Certification & Standard	IEC/EN 62109-1&2;IEC/EN61000-6-1;IEC/EN61000-6-2;EN61000-6-3; IEC/EN61000-6-4;IEC/EN61000-3-11; EN61000-3-12;IEC60529;IEC 60068;IEC61683;IEC62116;IEC61727;EN50549-1; AS 4777.2;NRS 097;VDE-AR-N-4105;CEI0-21;G98;G99;C10/C11	

*1. Nominal AC output power is 4999W for Australia and 4600W for Germany and South Africa.

*2. Maximum output current is 21.7A for Australia and 20A for Germany and South Africa.

*3. Minimum voltage for inverter to start power output.



3-Ph BluE Residential ESS

All In One Energy Storage System
CATL Battery Solutions



CATL LFP Battery, Stable and Safe
Module, Pack, System, Triple Protection



Adjustable Power in Each Phase
Support Diesel Generator Control(DI/DO)



Modular Design, Plug and Play
Mobile APP Monitoring



Supporting 200% Oversized PV Power
On&OFF Grid Parallel System

Battery Model		BluE-PACK5.1	
Physical		Operation	
Battery Type	LFP (LiFePO4)	Max. Charge/Discharge Current	50A/80A
Weight	54KG	Rated DC power	4096W
Dimension (W x H x D)	540*490*240mm	Max. Charge/Discharge Power	2825W/4096W
IP Protection	IP65	Operating Temperature Range	0 to 50°C charging -10 to 50°C discharging
Warranty	5 Year Product Warranty, 10 Year Performance Warranty	Humidity	0~95% (No condensation)
Electrical		BMS	
Energy Capacity	5.12kwh	Modules Connection	Max.8
Usable Capacity	4.6kwh	Capacity	200/400/600/800Ah
Depth of Discharge (DoD)	90%	Power Consumption	<2W
Nominal Voltage	51.2V	Communication	CAN & RS485
DC Circuit Breaker	125A	Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature measurement
Operating Voltage Range	44.8-56.5V	Certificate	
Internal Resistance	<20mΩ	Safety(Cell)	Pack: IEC/EN 62619;UN38.3 Cell: IEC/EN 62619;UN38.3;UL1973
Cycle Life	10000cycle		

Hybrid Inverter Model	E10KT
PV String Input	
Max. Continuous PV Input Power	20kW
Max. DC Voltage	1100V
Nominal Voltage	720V
MPPT Voltage Range	140V-1000V
MPPT Voltage Range (Full Load)	420V-850V
Start Voltage ¹	200V
Number of MPPT	2
Strings Per MPPT	1
Max. Input Current Per MPPT	15A
Max. Short-circuit Current Per MPPT	20A
AC Output (Grid)	
Nominal AC Output Power	10kW
Max. AC Apparent Power	11kVA
Nominal AC Voltage	400Vac
AC Grid Frequency Range	50 / 60Hz±5Hz
Nominal Output Current	14.5A
Max. Output Current	16A
Power Factor (cosΦ)	0.8Leading-0.8Lagging *
THDi	< 3%
Battery Input	
Battery Type	LFP (LiFePO4)
Nominal Battery Voltage	51.2V
Charging Voltage Range	44-58V
Max. Charging Current	160A
Max. Discharging Current	200A
Battery Capacity	200/400/600/800Ah
AC Output (Backup)	
Nominal AC Output Power	9.2kW
Max. AC Output Power	10kVA
Nominal Output Current	13.3A
Max. Output Current	14.5A
Nominal Output Voltage	400V
Nominal Output Frequency	50/60Hz
Output THDv (@Linear Load)	<2% (Linear Load)
Efficiency	
Max. PV Efficiency	97.60%
Euro. PV Efficiency	97.00%
Protection	
Anti-islanding Protection	Yes
Output Over Current Protection	Yes
DC Reverse Polarity Protection	Yes
String Fault Detection	Yes
DC/AC Surge Protection	DC Type II;AC Type III
Insulation Detection	Yes
AC Short Circuit Protection	Yes
General Specifications	
Dimensions W x H x D	540*980*240mm
Weight	49kg
Operating Temperature Range	-25°C~+60°C
Cooling Type	Natural Convection
Max. Operation Altitude	2000m
Operation Humidity	0~95% (No Condensation)
IP Class	IP65
Topology	Battery Isolation
Communication	RS485/CAN2.0/WIFI/4G
Display	LCD/APP

* 0.95Leading-0.95lagging for Germany.
1. Minimum voltage for inverter to start power output.

KAC50DP

50KW modular power converter



Flexible Configuration

- Modular Design, Expanding as Required
- Small&Light, Wall Mounted
- Installed in Parallel for Expansion



Powerful Function

- Support PV+ESS
- Grid Support, Equipped with SVG Technology
- On-Grid and Off-Grid Operation



Reliable Protection

- Outdoor IP65 Design
- Sufficient Protection Functions Equipped

Product Specifications	KAC50DP
PV Side	
Max. Input Voltage	1000V
MPPT Voltage Range	350V~800V
Max. Current per MPPT	36A
Number of MPPT	3
Number of Inputs Per MPPT	2
Battery Side	
Max. Input Voltage	750V
Min. Input Voltage	350V
DC Voltage at Nominal Operation	500V~750V
Max. DC Current	55A*2
Max. DC Input Power	55kW
Number of DC Inputs	2
AC Side(On Grid)	
Nominal AC Output Power	50kW
Max. AC Output Power	55kVA
Max. AC Current	80A
Nominal AC Voltage	400V
AC Voltage Range	340V~440V
Nominal Grid Frequency/Frequency Range	50/60Hz±5Hz
THDv	<3%(100% Load)
Adjustable PF Range	-1(Lagging)~1(Leading)
AC Side(Off Grid)	
Nominal AC Voltage	230/400V±3%; 3L+N+PE
THDv	<3%(Linear Load)
Nominal Grid Frequency/Frequency Range	50/60Hz
Nominal AC Output Power	50kW
Max. AC Output Power	55kVA
Efficiency	
Max. Efficiency	97.5%
Protection	
Reverse Connection Protection	Yes
DC Switch	Yes
Over-Temperature Protection	Yes
Grid Monitoring/ Earthing Fault Detection	Yes
Insulation Monitoring	Yes
DC/AC Surge Protection	DC Type II; AC Type III
General Parameters	
Dimensions(WxHxD)	650*715*325mm
Weight	75KG
Topology	Transformerless
IP Protection	IP65
Operation Temperature Range	-25~60°C(>45°C Derating)
Operation Humidity Range	0~100%(No Condensing)
Cooling Method	Intelligent Air Cooling
Max. Operation Altitude	3000m
Communication Port	RS485/CAN
Standards	IEC62477;IEC61000;CE;GB/T;IEC62109;IEC61683;IEC60068;IEC61727;IEC62116;EN50549;VDE4105;G99

BC100D

100kWh outdoor All-in-one ESS cabinet



Safe&Reliable

- CATL LFP Battery Cell
- Double Fire Suppression System Design
- 1+1 Redundancy Design



Simple&User-Friendly

- Pre-installed in Factory for Easy Installation on Site
- Integrated BMS/EMS, Suitable for Various Applications
- Effortless Operation, Cloud Control



Economical&Efficient

- Save Capex, Expanding as Required
- Efficient and Energy-saving HVAC Design

Outdoor battery cabinet parameters

Technical Parameters	BC100D
Battery Type	LFP
Battery Module Capacity	5.12kWh
Number of Modules	10*2
Total Battery Capacity	102.4kWh
Nominal Voltage	512V
Operating Voltage Range	448V~565V
Charge/Discharge Rate	Max. 0.5C
DoD	90%

General Parameters	BC100D
Dimensions(WxDxH)	1100 x 1100 x2380 mm
Weight	<1.5T
Installation Site	Outdoor
IP Protection	IP54
Anti Corrosion Level	C4
Operation Humidity	5%~95% (No Condensing)
Operation Temperature	-30°C~+50°C
Max. Operation Altitude	4000m (>3000m Derating)
Communication Port	Ethernet;CAN
Communication Protocol	CAN;MODBUS TCP/IP
Cooling Method	Air Conditioner
Standards	IEC62619-2017;UN38.3;IEC61000-6-2/4

KAC50DP-BC100DE

50kW/100kWh outdoor All-in-one ESS cabinet



Safe&Reliable

- CATL LFP Battery Cell
- Double Fire Suppression System Design
- 1+1 Redundancy Design



Simple&User-Friendly

- Pre-Installed in Factory for Easy Installation on Site
- Integrated BMS/EMS, Suitable for Various applications
- Effortless Operation, Cloud Control



Economical&Efficient

- Save Capex, Expanding as Required
- Efficient and Energy-Saving HVAC Design

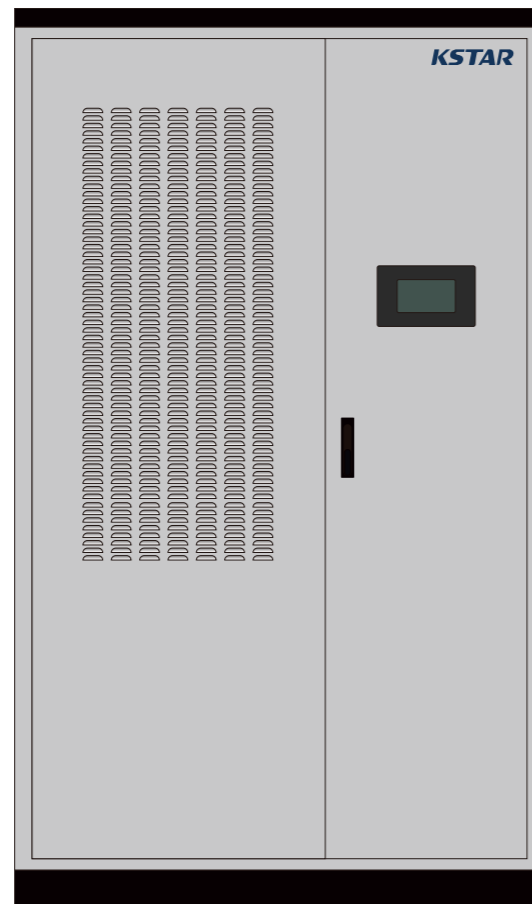
Outdoor Battery Cabinet Parameters

Technical Parameters		General Parameters	
Battery Type	LFP	Dimensions(WxDxH)	1100 x 1100 x2380 mm
Battery Module Capacity	5.12kWh	Weight	<1.5T
Number of Modules	10*2	Installation Site	Outdoor
Total Battery Capacity	102.4kWh	IP Protection	IP54
Nominal Voltage	512V	Anti Corrosion Level	C4
Operating Voltage Range	448V~565V	Operation Humidity	5%~95% (No Condensing)
Charge/Discharge Rate	Max. 0.5C	Operation Temperature	-30°C~+50°C
DoD	90%	Max. Operation Altitude	4000m (>3000m Derating)
		Communication Port	Ethernet;CAN
		Communication Protocol	CAN;MODBUS TCP/IP
		Cooling Method	Air Conditioner
		Standards	IEC62619-2017;UN38.3;IEC61000-6-2/4

Product Specifications	KAC50DP
PV Side	
Max. Input Voltage	1000V
MPPT Voltage Range	350V~800V
Max. Current per MPPT	36A
Number of MPPT	3
Number of Inputs Per MPPT	2
Battery Side	
Max. Input Voltage	750V
Min. Input Voltage	350V
DC Voltage at Nominal Operation	500V~750V
Max. DC Current	55A*2
Max. DC Input Power	55kW
Number of DC Inputs	2
AC Side(On Grid)	
Nominal AC Output Power	50kW
Max. AC Output Power	55kVA
Max. AC Current	80A
Nominal AC Voltage	400V
AC Voltage Range	340V~440V
Nominal Grid Frequency/Frequency Range	50/60Hz±5Hz
THDv	<3%(100% Load)
Adjustable PF Range	-1(Lagging)~1(Leading)
AC Side(Off Grid)	
Nominal AC Voltage	230/400V±3%; 3L+N+PE
THDv	<3%(Linear Load)
Nominal Grid Frequency/Frequency Range	50/60Hz
Nominal AC Output Power	50kW
Max. AC Output Power	55kVA
Efficiency	
Max. Efficiency	97.5%
Protection	
Reverse Connection Protection	Yes
DC Switch	Yes
Over-Temperature Protection	Yes
Grid Monitoring/ Earthing Fault Detection	Yes
Insulation Monitoring	Yes
DC/AC Surge Protection	DC Type II;AC Type III
General Parameters	
Dimensions(WxHxD)	650*715*325mm
Weight	75KG
Topology	Transformerless
IP Protection	IP65
Operation Temperature Range	-25~60°C(>45°C Derating)
Operation Humidity Range	0~100%(No Condensing)
Cooling Method	Intelligent Air Cooling
Max. Operation Altitude	3000m
Communication Port	RS485/CAN
Standards	IEC62477;IEC61000;CE;GB/T;IEC62109;IEC61683;IEC60068;IEC61727;IEC62116;EN50549;VDE4105;G99

KAC50-250DS

50-250KW outdoor PCS cabinet



IP54 Outdoor Design



Modular PCS ,
Expanding as Required



Grid Support, Equipped
with SVG Technology



Built-in ATS&TRS, With
Automatic On/Off Grid
Switching



Powerful Protection Functions
with Perfect Parallel Ability



Adjustable Setting of
Active/Reactive Power

Product Specifications	KAC50DS	KAC100DS	KAC150DS	KAC200DS	KAC250DS
Battery Side					
Max. Input Voltage	750V				
Min. Input Voltage	350V				
DC Voltage at Nominal Operation	500V~750V				
Max. DC Current	55A*2	55A*4	55A*6	55A*8	55A*10
Max. DC Input Power	55kW	110kW	165kW	220kW	275kW
Number of DC Inputs	2	2*2	2*3	2*4	2*5
AC Side(On Grid)					
Nominal AC Output Power	50kW	100kW	150kW	200kW	250kW
Max. AC Output Power	55kVA	110kVA	165kVA	220kVA	275kVA
Max. AC Current	80A	160A	240A	320A	400A
Nominal AC Voltage	400V				
AC Voltage Range	340V~440V				
Nominal Grid Frequency/Frequency Range	50/60Hz±5Hz				
THDv	<3%(100% Load)				
Adjustable PF Range	-1(Lagging)~1(Leading)				
AC Side(Off Grid)					
Nominal AC Voltage	230/400V±3%; 3L+N+PE				
THDv	<3%(Linear Load)				
Nominal Grid Frequency/Frequency Range	50/60Hz				
Nominal AC Output Power	50kW	100kW	150kW	200kW	250kW
Max. AC Output Power	55kVA	110kVA	165kVA	220kVA	275kVA
Efficiency					
Max. Efficiency	97%				
Protection					
Reverse Connection Protection	Yes				
DC Switch	Yes				
AC Breaker	Yes				
Over-Temperature Protection	Yes				
Grid Monitoring/ Earthing Fault Detection	Yes				
Insulation Monitoring	Yes				
DC/AC Surge Protection	DC Type II;AC Type III				
General Parameters					
Dimensions(WxHxD)	1170*2380*930mm				
Weight	800KG	1000KG	1200KG	1400KG	1600KG
ON/Off Grid Switch	Yes				
Topology	Transformerless (Optional Off-Grid Isolation Transformer)				
IP Protection	IP54				
Operation Temperature Range	-30~60°C				
Operation Humidity Range	0~100%(No Condensing)				
Cooling Method	Intelligent Air Cooling				
Max. Operation Altitude	3000m				
Display	LCD				
Communication Port	RS485/CAN				
Standards	IEC62477;IEC61000;IEC61683;IEC60068;IEC61727;IEC62116;EN50549;VDE4105;G99				


KESS Series Integrated Energy Storage System


C&I KESS20HG/40HG




Model	KESS20HG	KESS40HG
Power Range	50-630kW	100-1250kW
Battery Capacity	Customised	Customised
PV Input Access	Optional	Optional
On/Off-Grid Switching	Optional	Optional
PCS Chamber Cooling Method	Smart Fan Cooling	Smart Fan Cooling
Battery Chamber Cooling Method	Air Conditioner	Air Conditioner
Fire Suppression System in Battery Chamber	FM200/Novoc 1230	FM200/Novoc 1230
Ambient Temperature	-15°C-45°C	-15°C-45°C
Max Altitude	3000m	3000m
Relative Humidity Range	5%-95% (No Condensation)	5%-95% (No Condensation)
Protection Degree	IP54	IP54
Dimensions(L * W* H)	6058*2438*2896mm	12192*2438*2896mm
Communication to SCADA	Ethernet (IEC104)	Ethernet (IEC104)


- 


LFP Battery System, PCS, Fire Suppression System
- 


Standard 20/40 Feet Container, Easy Transportation
- 

Smart and Efficient HVAC Design for Lower Loss and Better Safety
- 

Quicker One-stop Delivery with In-factory Installation and Commissioning
- 

HVRT/LVRT
- 

Standard Communication Portal, Fitting Third Party SCADA
- 

Equipped with PQ, VSG, VF, and Black Start
- 

IP54 Protection, Can Handle Harsher Outdoor Environment

EMS Energy Management System

EMS Cloud Platform



Friendly human interaction interface:

- ◆ Combined with comprehensive data acquisition and monitoring system functions.

24/7 real-time monitoring:

- ◆ Seamless accessing to the scheduling center, and receiving scheduling command.
- ◆ Realizing friendly data transmission between BMS and PCS devices.
- ◆ Real-time response fault alarm function.

Flexible application scenarios:

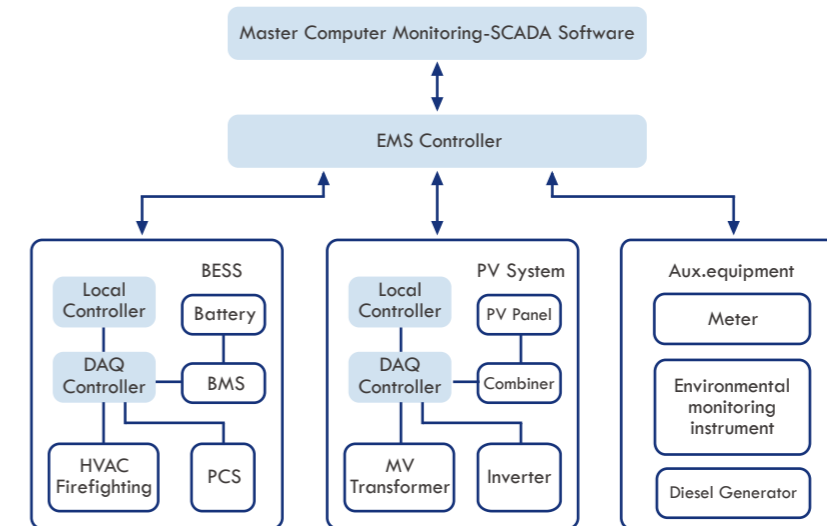
- ◆ Advanced control strategy to realize peak and frequency modulation, peak and valley arbitrage, demand management, etc.

Function Presentation:

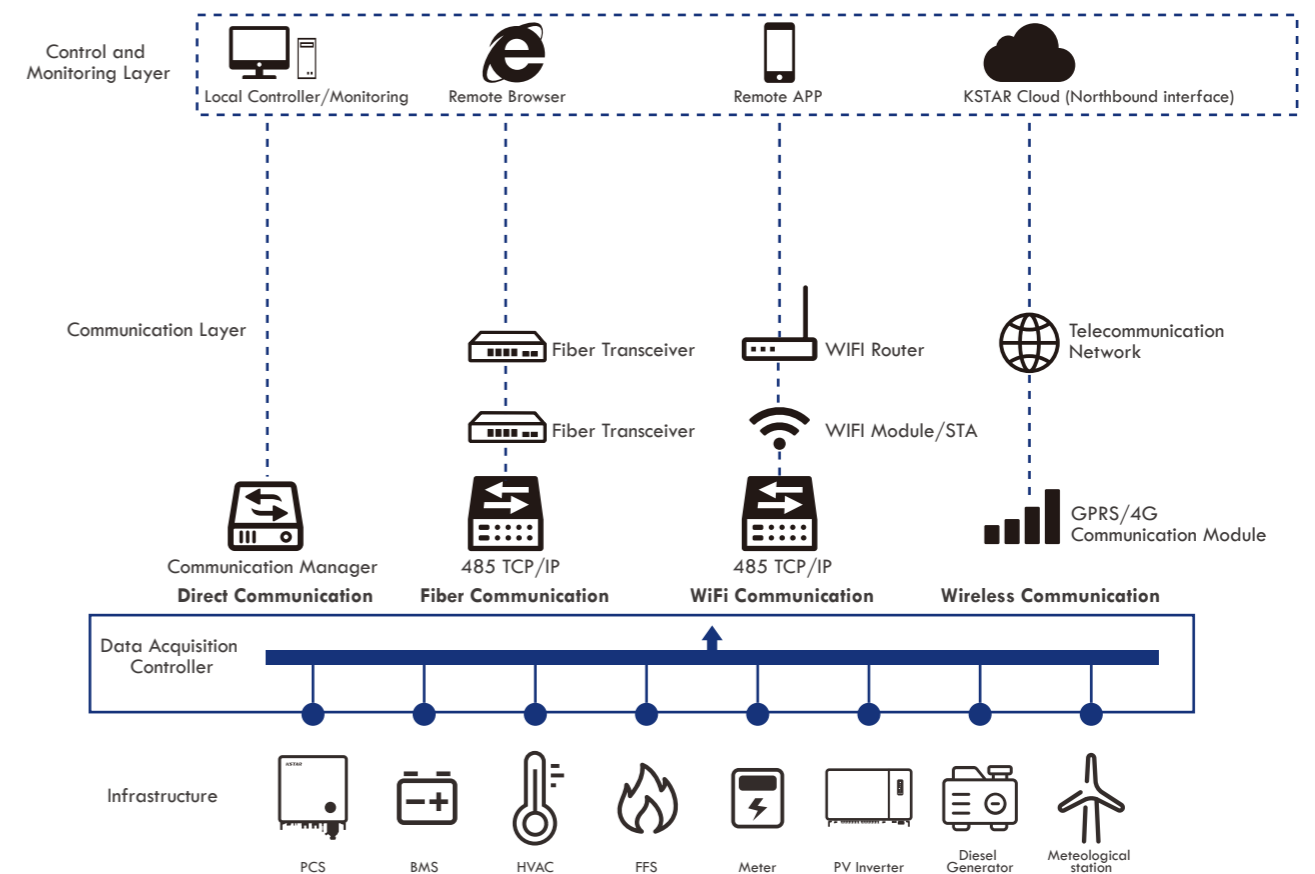
Platform Function	Detailed Presentation
Operation data acquisition and monitoring	EMS local controller collects the real-time information (i.e. PCS, BMS, transformer monitoring and control device), and the processed data (i.e. real-time values, historical statistics, trends, alarm events, etc.) can be displayed and forwarded in the monitoring screen, and saved to the historical data server.
Independent SOC control	When EMS cannot control operation of energy storage battery, PCS control charging and discharging of energy storage battery independently to keep SOC within reasonable range.
Smooth Output	Generation side - EMS control the charge and discharge of BESS or the output of other power generation to smooth power output by real-time monitoring of power generation User side - EMS control the charge and discharge of BESS to achieve peak shifting by real-time monitoring of power consumption.
Time-of-use price	EMS control the battery energy storage to perform different charging and discharging strategies at different time of use price, so that the user can realize peak-valley arbitrage.
Power distribution control	In the on-grid mode, EMS follows power grid dispatching orders and data acquisition (i.e. current SOC, SOH, charging and discharging state, and alarm data) to implement power distribution control.
Anti-power reversal control	when the microgrid access to power grid, EMS ensures the micro grid to meet load electricity consumption by increasing the energy storage charging power or reducing power generation output.
Power security boundary control	Due to the sudden load fluctuation in the micro-grid system (i.e. solar, wind), the system adopts emergency control measures to increase/decrease the system output to make it return to the safe operating range.

Energy Management System

Energy Management System



Data Acquisition and Communication Structure







► 50kW/200kWh BESS for EV Charger Station in Hebei



► Mobile Energy Storage Vehicle of OptimumNano Energy Company



► 3MW/12MWh BESS Demonstration Project in Shenzhen



► 500kWh Multi-energy Complementary Project of Beike Industrial Park



► 300kWh Storage Project of Brazilian Military Antarctic Research Station



► BESS for EV Charger Station in Harbin