Industrial battery energy storage system

Plug and play Container solutions

From 3.4 MWH to 102.6 MWH

FFD Power Tec Co., LTD

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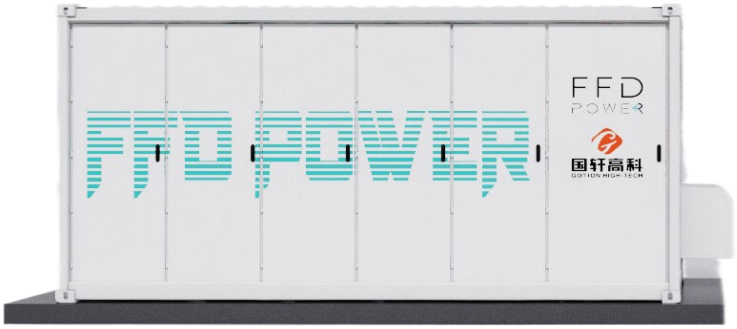
Galaxy 3420 -3.4MWH Battery with 1250KW PCS——0.36C System

BCS1250K-B-HUD

Power Conversion System 1250 KVA

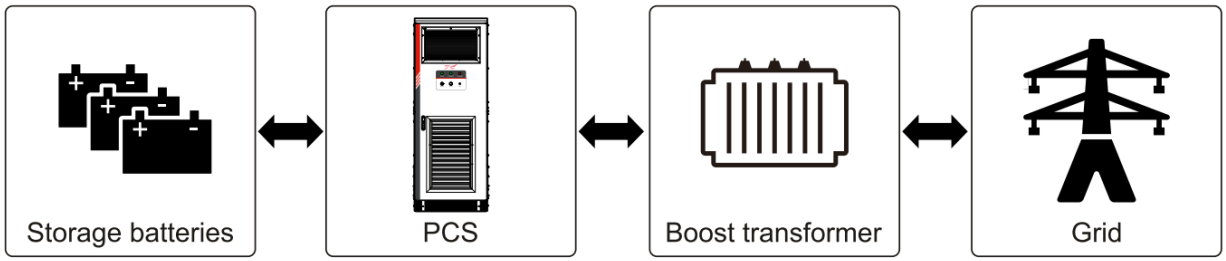


GALAXY 3420

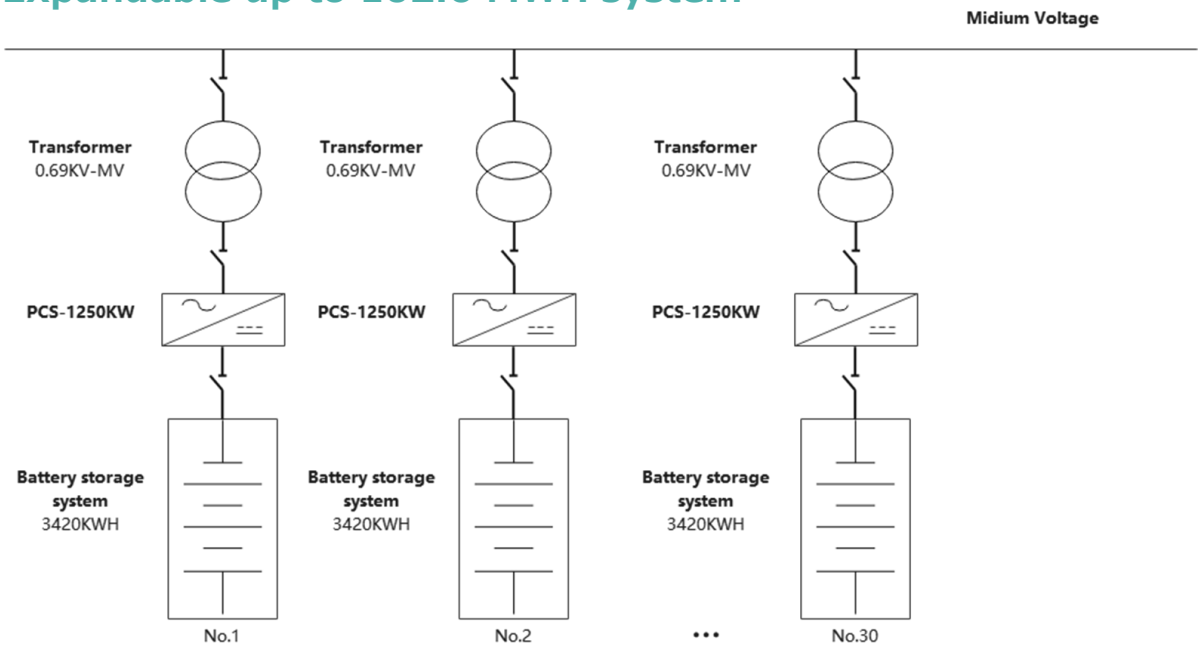
Energy Storage Container - 3.42MWH

TBEA 1250KVA

Dry Type Boost/Isolation Transformer



Expandable up to 102.6 MWH system



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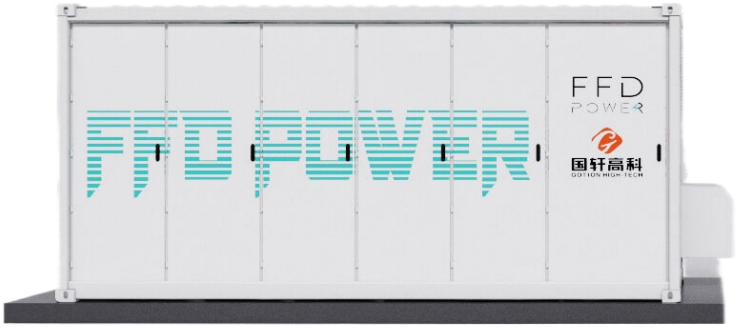
Galaxy 3420 -3.4MWH Battery with 1725KW PCS——0.5C System

BCS1725K-B-HUD

Power Conversion System 1725 KVA

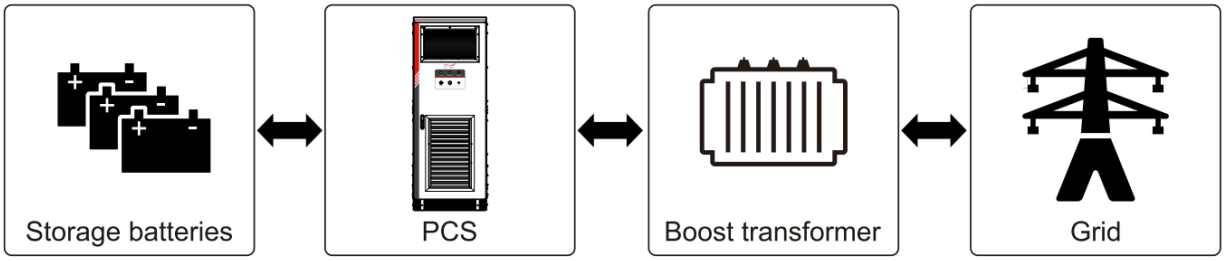


GALAXY 3420

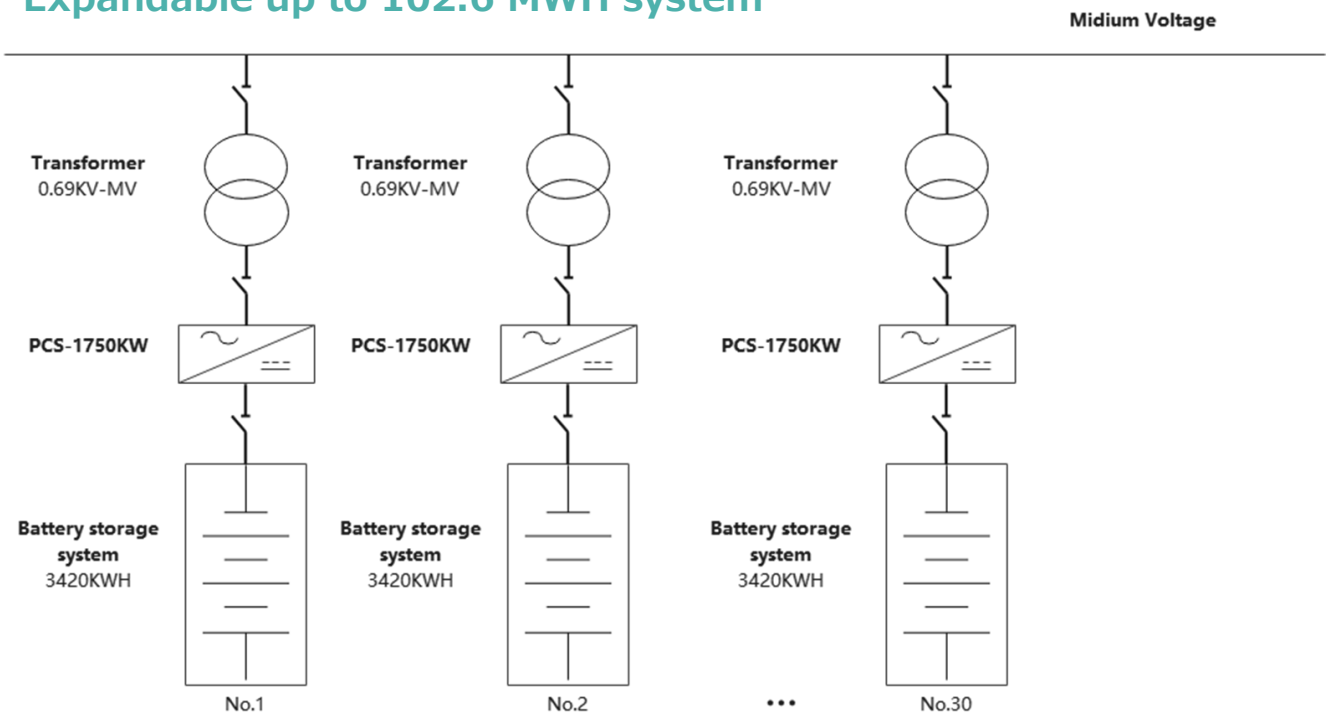
Energy Storage Container - 3.42MWH

TBEA 2000KVA

Dry Type Boost/Isolation Transformer



Expandable up to 102.6 MWH system



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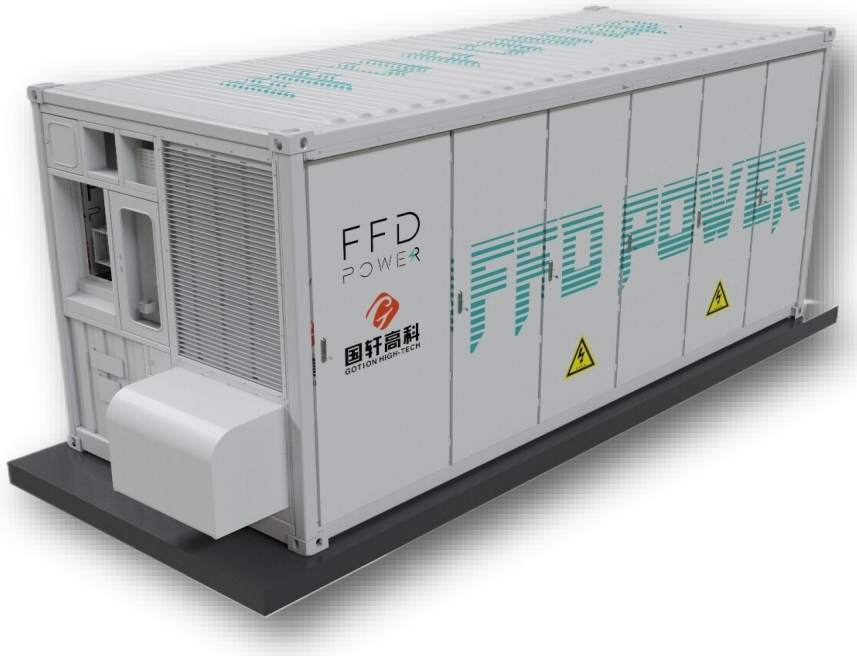
Galaxy 3420-3.4 MWH Energy Storage Container (20GP) :



Energy storage systems contribute to more effective energy utilization and management, reducing electricity expenses. They find application in various scenarios, including peak-valley arbitrage for power consumers, grid frequency regulation and peak shaving, enhancing the integration of renewable energy sources, and improving grid power supply stability.

In summary, energy storage stations play a significant role in three key grid scenarios:

Generation Side: Energy storage stations are primarily utilized to smooth the output of renewable energy generation or for combined frequency regulation with conventional power generation units, thereby improving power quality.

Grid Side: Energy storage stations are employed in transmission and distribution grids to fulfill functions such as peak shaving, frequency regulation, emergency backup, and black start capabilities.

Consumer Side: Energy storage stations serve the purpose of lowering user energy costs through peak shaving strategies based on time-of-use pricing.

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Key Features of the Galaxy 3420 Energy Storage Container

- The energy storage system employs independently developed and manufactured lithium iron phosphate batteries from Gotion High-Tech, featuring high safety, an exceptionally long cycle life, superior rate capability, and eco-friendly, pollution-free characteristics. It stands as the preferred choice for both electric vehicle power and energy storage applications.
- Large storage capacity and high conversion efficiency of the battery.
- Utilizes Gotion High-Tech's independently developed Battery Management System (BMS), which can real-time monitor parameters such as single-cell voltage, temperature, total current, total voltage, and ambient temperature. The BMS incorporates multiple protection functions, including overcharging and overdischarging prevention, ensuring system flexibility, reliability, and scalability for upgrades.
- CAN interface design reduces the complexity of advanced energy storage system application development.High modularity of container installation with a simple structure, facilitating easy installation and maintenance.
- Comprehensive and multi-level battery protection strategies to guarantee the safe operation of the energy storage system.Equipped with an intelligent liquid cooling temperature control system, achieving approximately 30% improvement in energy consumption efficiency compared to traditional air cooling. The maximum temperature difference for megawatt-scale battery systems is around 3-5°C.
- The container is configured with an automatic fire alarm and firefighting system, featuring audio-visual alarm functionality.
- Includes fire hydrant connection and corresponding water firefighting pipelines, explosion-proof lighting system, and access control system.
- Remote monitoring system for real-time monitoring of the battery pack's operation inside the combiner box.
- Outdoor application design with an IP54 protection rating.

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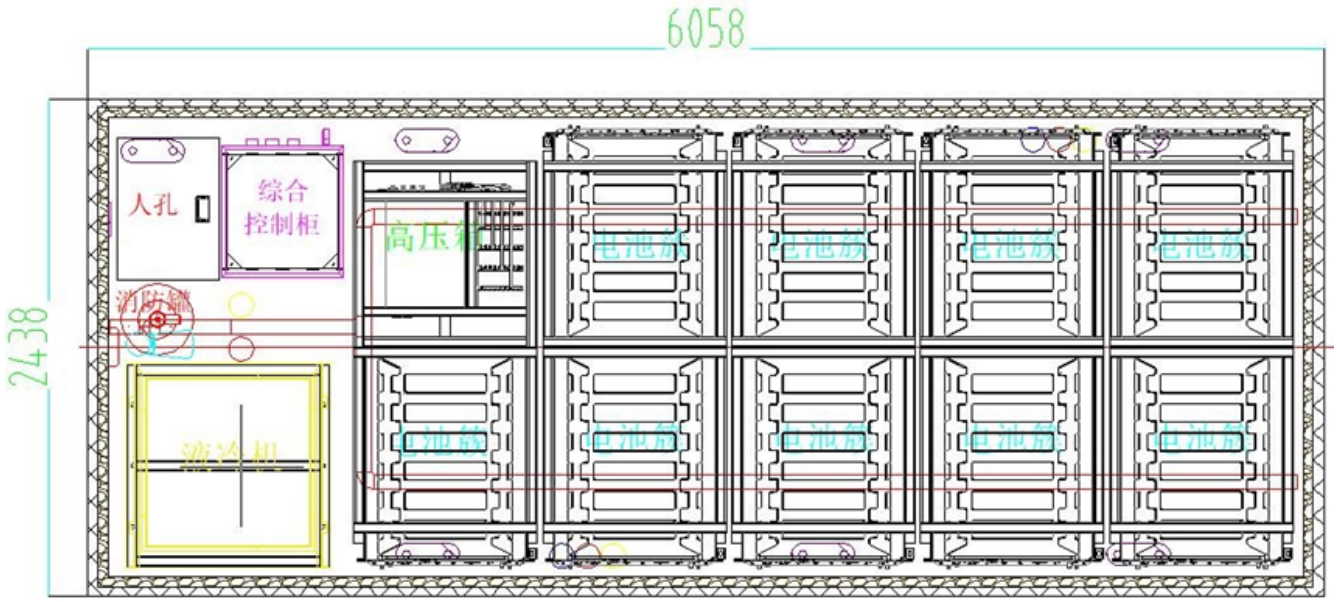
Galaxy3420- 3.4MWH Energy Storage Container Internal Composition

The 3.42MWh battery container consists of a battery container body, including distribution and uninterruptible power supply (UPS) systems, an automatic fire suppression system, video surveillance system, liquid cooling temperature control system, and submerged fire extinguishing system. Additionally, it encompasses the battery energy storage system, comprising battery racks, battery modules, DC combiner box, and control cabinet, as well as lightning protection and grounding systems.

The structural layout diagram of the battery container is depicted in the figure below.



Battery Container: It includes the cabinet and internal auxiliary functions. This encompasses an overall internal rack load design, heat dissipation design, lighting functionality, thermal insulation, dustproof, waterproof, and insect-proof features compliant with IP54 protection level, meeting the energy storage system's application requirements in various complex environments.

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Galaxy3420- 3.4MWH Energy Storage Container Internal Composition

Automatic Fire Suppression System: Utilizing a fire extinguishing system primarily composed of Perfluorohexanone(C6F12O) /Heptafluoropropane (C3HF7) it is equipped with an automatic alarm device. Upon detecting a fire, the container can promptly disconnect electrical connections with external devices, activate the fire suppression system, and upload alarm information to the backend monitoring system, featuring interlocking capabilities.

Intelligent Liquid Cooling Temperature Control and Fire Safety System: The battery system is equipped with an intelligent liquid cooling system and a battery pack-level submerged fire extinguishing system. This system achieves precise temperature control and temperature field balance for each battery pack through an intelligent liquid cooling unit. It ensures a 5°C temperature difference control for megawatt-scale battery systems and real-time monitoring, accurate positioning, early suppression, and submerged fire extinguishing for each battery pack, guaranteeing the safe and reliable operation of the battery system.

Battery Energy Storage System: Each battery container consists of 9 clusters, with each cluster composed of 9 battery modules. Each module consists of 44 cells in series with 300Ah each, making the rated energy for each battery cluster 380.16kWh. The rated energy for the battery container is 3.42MWh (9 clusters). From cells to battery pack arrays, a modular and standardized integrated design is employed. The battery system adopts a three-level BMS control architecture, providing reliable battery balancing, safety management, thermal management, and comprehensive monitoring.

DC Combiner Box: It connects the high-voltage control line and the intermediate unit of the Power Conversion System (PCS). The cabinet is equipped with battery system busbar isolators, fuses, a three-level BMS, power supplies, etc. The combiner control cabinet is designed to consider the electrical characteristics, heat dissipation, safety, and operability and maintainability of various components. It has CAN, RS-485, RJ45 Ethernet communication interfaces, enabling communication functions with high-voltage control boxes and PCS for data communication, control, and protection of the energy storage system.

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Galaxy3420- 3.4MWH Energy Storage Container Technical Parameters

Energy storage system configuration parameter table	
MODEL	Galaxy 3420 (20GP)
System capacity (MWh)	3.421MWH
Annual Availability Rate	≥98%
System efficiency	≥86%
Rated DC voltage (V)	1267.2V
DC bus voltage range (V)	1108.8V~1425.6V
Communication method	Ethernet, CAN 2.0, RS485
Protection level	IP54
Operating environment temperature (℃)	-20℃~55℃
Maximum altitude allowed (m)	≤2000
Fire Fighting System	Fire alarm, Perfluorohexanone(C6F12O)/ Heptafluoropropane （C3HF7)
Size（L*W*H，mm）	6058×2438×2896mm
Weight	≈37t

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Galaxy3420- 3.4MWH Battery Cell Technical Parameters

The battery cells utilize lithium iron phosphate cells specifically developed for energy storage by Gotion High-Tech, with the model IFP81175200A-300Ah. All cells are of Grade A quality. At an ambient temperature of 25°C and a charge/discharge rate of 0.5C/0.5C, the cycle life of the cells is ≥8000 cycles.

Battery Cell technical parameters	
Battery Model	IFP81175200A-300Ah
Battery materials	LFP
Battery grade	New A grade
Cell capacity (Ah)	300AH
Rated Voltage	3.2 V
Voltage range	2.8V~3.6V
Charging current	150A
Discharging current	150A
DC side initial charge and discharge efficiency	≥94%
Charging operating temperature range (℃)	0℃~55℃
Discharging operating temperature range (℃)	-30℃~60℃
Cycles	≥8000 0.5P@25℃ 90%DOD, 70%EOL
Size（L*W*H，mm）	(81.2±0.5)×(175.4±0.5)×(202.6±0.5)mm
Weight	5998±300g

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Galaxy 3420-3.4MWH Battery Module Technical Parameters

The battery module consists of 44 individual battery cells configured in a 1P44S arrangement, with a total energy capacity of 41.8 kWh and a nominal voltage of 140.8V.

Battery module technical parameters	
MODEL	EPD140-05P42
Arrange in groups	1P44S
Rated Capacity	300AH
Rated Voltage	140.8V
Rated Energy	42.24KWH
Standard charging conditions	Constant power (CP), constant current (CC), constant voltage (CV)
	Power: 21.12KW (0.5CP)
	Termination voltage: 158.4V
Standard discharging conditions	Constant power (CP), constant current (CC),
	Power: 21.12KW (0.5CP)
	Termination voltage: 123.2V
Cycles	≥8000 0.5P@25℃ 90%DOD， 70%EOL
System voltage	≤1500V
Cooling Method	Liquid
Storage temperature	+25 ℃ ~ +45 ℃
Humidity	≤85% RH (no condensation)
Weight	≈313kg
Dimensions (L*W*H)	(1085±3)×(787±3)×(235±3)mm

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Galaxy 3420-3.4MWH Battery Cluster Technical Parameters

Each battery cluster consists of 9 modules

Battery cluster technical parameters	
Product number	ERD1267-05P380
Cell type	IFP81175200A-300Ah
Module type	EPD140-05P42
Combination method	1P396S
Battery cluster nominal voltage (V)	1267.2
Battery cluster voltage range (V)	1108.8～1425.6
Rated capacity (Ah)	300
Battery cluster nominal capacity (kWh)	380.16
Rated charge and discharge rate	0.5P
Working temperature range (℃)	Charge：0℃～55℃ Discharge：-30℃～60℃
Humidity(%)	≤95%
Cooling method	Liquid
Size (W*D*H)	896mm x 1065mm x 2385mm
Weight (Kg)	about 3000

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Kehua BCS1250K-B-HUD

1250KW Power Conversion System Technical Parameters

Power Conversion System Technical Parameters	
Item	BCS1250K-B-HUD
DC Input	
Max. DC voltage	1500Vdc
DC voltage range	1000-1500Vdc
Max. DC current	1543A
Soft Start	YES
AC Output (On-Grid)	
Rated AC output power	1250KW@45℃
Max. AC output power	1375kVA
Rated grid-tied voltage	690Vac 3P3W+PE
Grid voltage range	-15%~10% (settable)
Grid frequency range	50Hz
Max. output current	1151A
Power factor	>0.99 (at rated power)
Adjustable power factor	1 (leading)~1 (lagging)
THDi	< 3% (at rated power)

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FFD POWER

Kehua BCS1250K-B-HUD

1250KW Power Conversion System Technical Parameters

AC Output (Off-Grid)	
Rated AC output voltage	690Vac
Output voltage accuracy	1%
Max. output current	1151A
THDu	< 3% (liner load)
Rated output frequency	50Hz/60Hz
Overload capability	110% overload
PCS efficiency	
Max. efficiency	99%
General data	
Isolation mode	None
IP rating	IP55
Operation temperature	-35ºC~60ºC (>45ºC derating)
Relative humidity	0~100% (no condensation)
Cooling type	Intelligent forced air cooling
Dimensions (W×H×D)	860×2270×1725mm
Weight	1500Kg
Altitude	4000m (>2000m customized)
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, EN 50549-10, NC RfG, IEC 62116, IEC 61727
✦ Specification indexes may be subject to changes without further notice	

The transformer type and transformer parameters need to be customized according to the specific project, so the transformer parameters are not fixed values. Specific parameters will be issued separately according to specific needs.

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Kehua BCS1725K-B-HUD

1725KW Power Conversion System Technical Parameters

Power Conversion System Technical Parameters	
Item	BCS1725K-B-HUD
DC Input	
Max. DC voltage	1500Vdc
DC voltage range	1000-1500Vdc
Max. DC current	1936A
Soft Start	YES
AC Output (On-Grid)	
Rated AC output power	1725KW@45℃
Max. AC output power	1897.5kVA
Rated grid-tied voltage	690Vac 3P3W+PE
Grid voltage range	-15%~10% (settable)
Grid frequency range	50Hz
Max. output current	1588A
Power factor	>0.99 (at rated power)
Adjustable power factor	1 (leading)~1 (lagging)
THDi	< 3% (at rated power)

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1725KW Power Conversion System Technical Parameters

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Rated AC output voltage	690Vac
Output voltage accuracy	1%
Max. output current	1151A
THDu	< 3% (liner load)
Rated output frequency	50Hz/60Hz
Overload capability	110% overload
PCS efficiency	
Max. efficiency	99%
General data	
Isolation mode	None
IP rating	IP55
Operation temperature	-35ºC~60ºC (>45ºC derating)
Relative humidity	0~100% (no condensation)
Cooling type	Intelligent forced air cooling
Dimensions (W×H×D)	860×2270×1725mm
Weight	1500Kg
Altitude	4000m (>2000m customized)
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, EN 50549-10, NC RfG, IEC 62116, IEC 61727
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