PowerHub

MODULAR THREE PHASE UPS SERIES

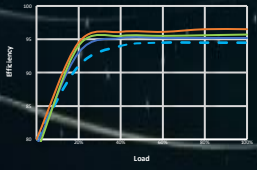
PRESTIGE UPS

Reliable High Power Modular UPS solution
tailored for all mission critical environment

Scalable from 300kW to 1000kW
Parallel-capacity up to 4MW

The genuine safe-swap modularity of the modules contributes to maximizing system uptime. This feature allows for effortless addition or removal of modules without necessitating a UPS bypass.

The touch-screen LCD control panel provides administrators with the capability to oversee and control the UPS status effectively.



Enhanced energy efficiency substantially lowers both operational expenses of the system and the associated air-conditioning costs for the site.

LITHIUM ION COMPATIBLE

Lithium-ion Battery system exhibits superior traits in UPS applications, leading to advantages such as high energy density, extended lifespan, versatile installation options, enhanced cycle life, and a reduced Total Cost of Ownership (TCO).

The Use of Modular UPS in Data Centers

APECUS was privileged to support all our customers in the move towards a digital and modular design approach in the data centers. Our experts worked closely with customers' technical and facility team

Maximise Capital Investment Resources

Modular power system architecture approach allows infrastructure to be deployed as needed to meet demand, instead of being deployed up front.

Maximise Energy Efficiency

The number one cause of data center inefficiency is overcapacity. Scalable modular power system avoids this problem through rightsizing. Many other causes of inefficiency are also mitigated by pre-engineering and standardization.

Flexible Design For Power Density

Modular design allows decisions such as power density to be deferred until time of deployment, instead of being made years in advance

Improve Cost Efficiency And Ease Of Maintenance

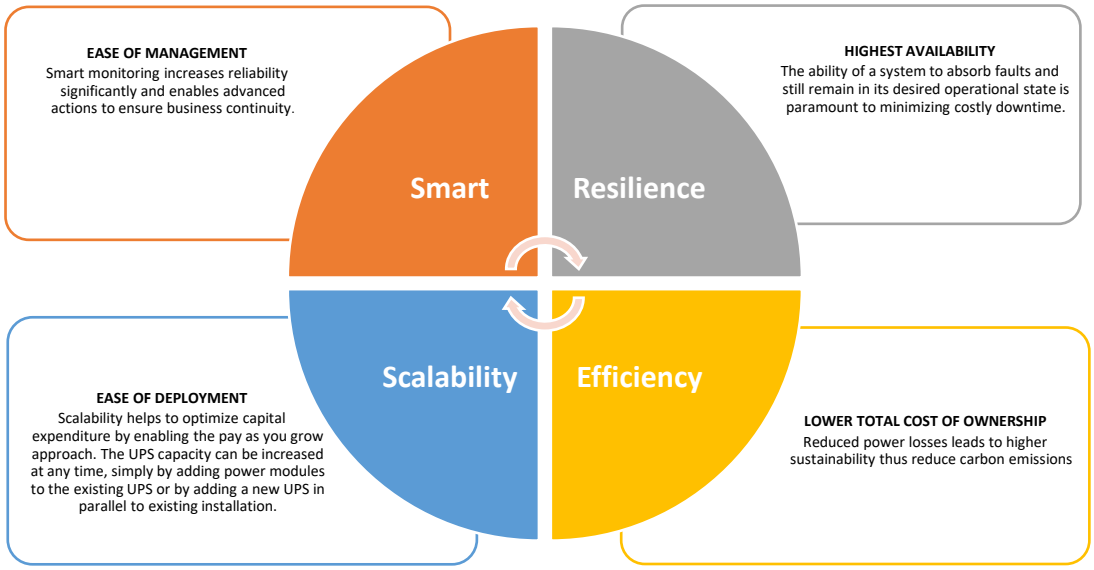
Implementing a modular power system architecture not only allows data centers to grow their capacity, but also improves cost efficiency and ease of maintenance.

Solutions for Optimizing Space

Modular UPS are smaller in footprints and capacity can be increased at any time, simply by adding power modules to the existing UPS or by adding a new UPS in parallel to the existing installation.

PRESTIGE UPS

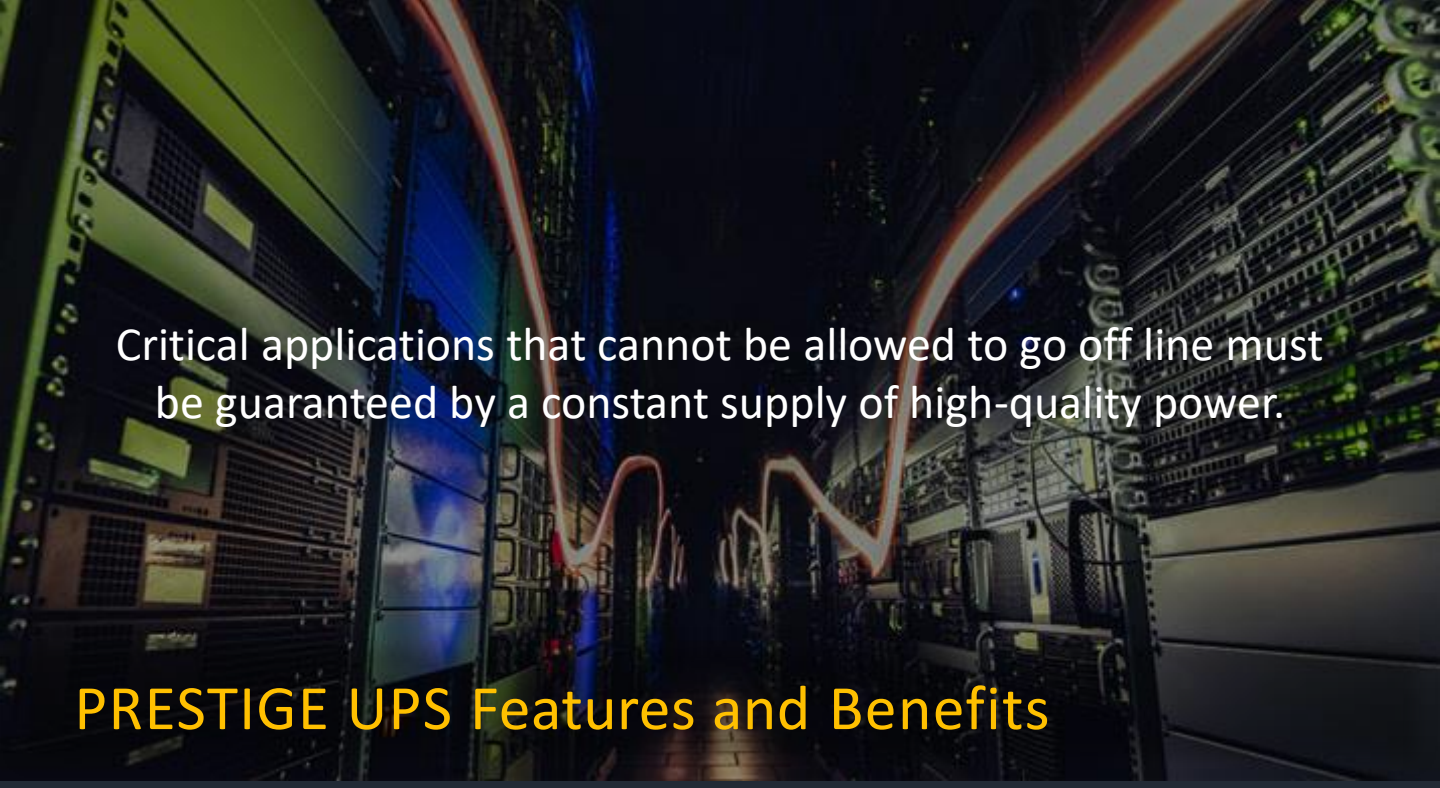
The Prestige UPS is the Modular UPS system that combines high AC/AC efficiency values with a compact footprint and a flexible and scalable architecture, able to reach up to 1000 kVA. The system cabinets are available in various dimensions, able to connect up to 4, 5, 10 or 20 power modules (including redundancy).



Power Rating

300 – 1000kVA

Can be parallel up to 4MVA



Critical applications that cannot be allowed to go off line must be guaranteed by a constant supply of high-quality power.

PRESTIGE UPS Features and Benefits

The Prestige UPS integrates cutting-edge 3 Layer IGBT Technology, offering a compelling combination of high efficiency and reliability. This system is not only space-saving, robust, scalable, and flexible but is also straightforward to deploy and manage. It stands out as an ideal backup power solution for modern data centers, commercial buildings, the healthcare industry, and various other applications.

Key features

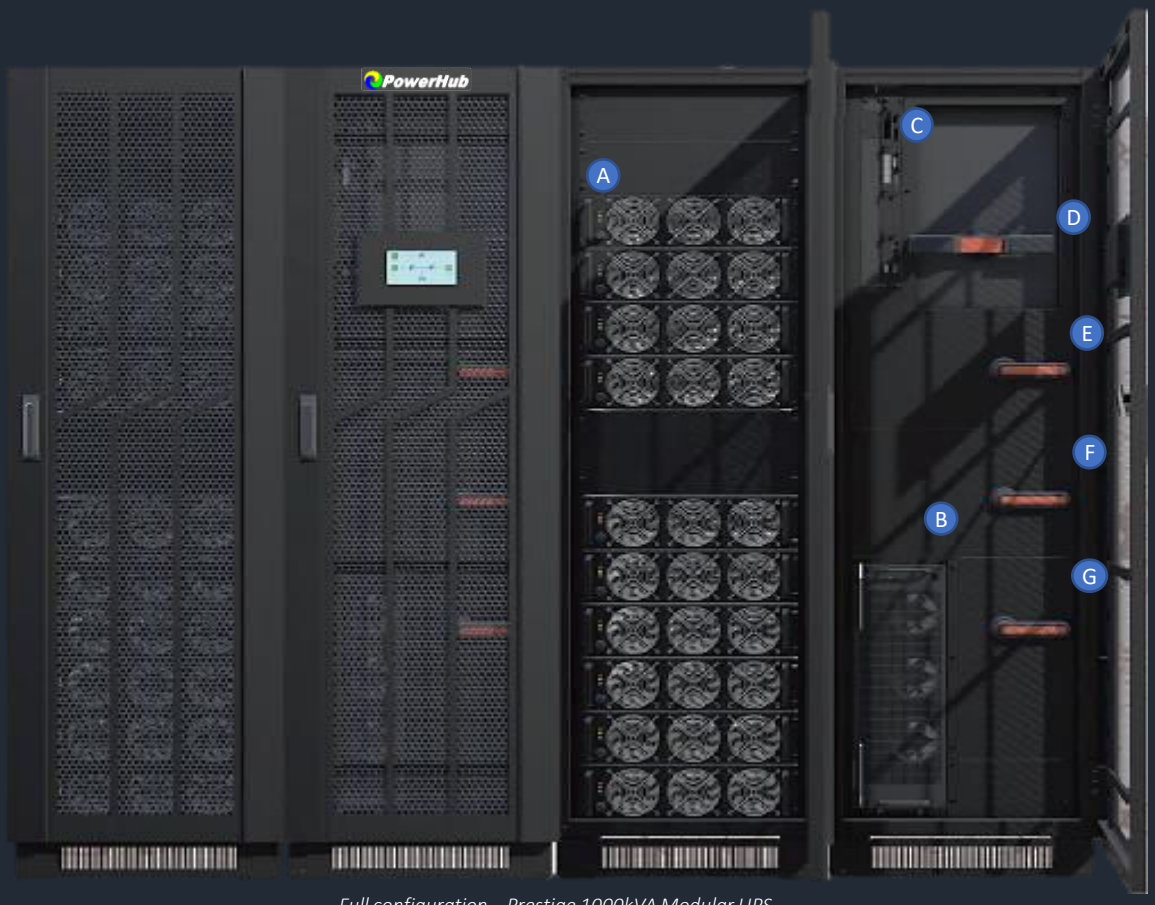
- Modular design, power module, bypass module, monitoring module are hot-swappable
- High input/ Output power factor= 1 (input 0.999)
- Wide input voltage range(138~485Vac)
- On-line double conversion with DSP control design
- 3-Level inverter, IGBT PFC, high efficiency is up to 96%
- Support connecting to unbalance load
- Support maximum 6 units in parallel
  (4 units when ≥ 800kVA)
- Intelligent fan speed regulation
- No derating for PF>= 0.5 inductive load and capacitive load;
- Lead Acid Battery number 30-50pcs settable
- Lithium-Ion Battery Compatible
- Common Battery Bank
- LBS function, compliance class A requirement
- Loop parallel signal control system, avoid any single failure
- Flexible Dual & Separate input source configuration
- Multiple communication interface: RS232, RS485, Parallel, LBS, Dry contact port, Relay card(optional), SNMP card(optional), Battery temperature sensor(optional)
- High power density design, requirement smaller footprint space
- Structured design easy for maintenance

Ideal for mission-critical applications in:

- Data centres
- Healthcare
- Commercial buildings
- Control centres

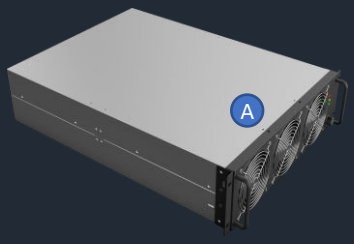
Functional Core of Prestige UPS

Illustrated with Prestige 1000kVA UPS model, applicable to other models in the range.



Full configuration – Prestige 1000kVA Modular UPS

- A 50kW HOT-SWAPPABLE power modules (1 - 20)
- B Hot replaceable STSW module
- C Monitoring Module
- D Maintenance Breaker
- E Main Input Breaker
- F Output Switch
- G Bypass Switch



01----ECU module 1_Parallel port
02----ECU module 1_ LBS
03----ECU module 1_Indicator
04----ECU module 2_Parallel port
05----ECU module 2_ LBS
06----ECU module 2_Indicator
07----Input dry contact
08----BAT-T port(thermistor)
09----R-CAN port
10----USB port
11----RS232 Port
12----Display Port
13----BAT-T Port
14----RS485 Port
15----RS485 Port
16----FE port (reserved)
17----CAN Port
18----Output Dry Contact
19----Bypass Back-feed Port

Reduce Total Cost of Ownership

The Prestige UPS is more efficient than a conventional monolithic UPS, thanks to a number of leading technologies.

Enhancing Efficiency Technologies

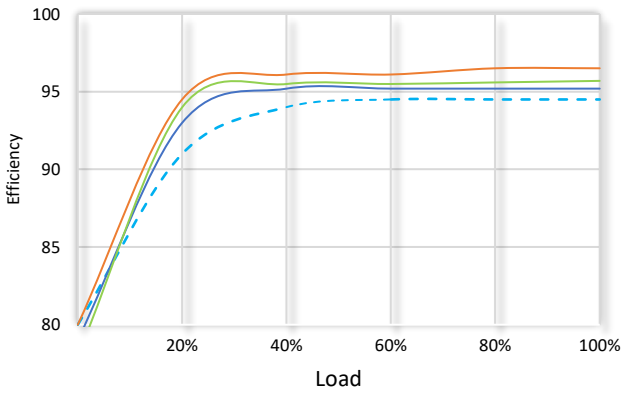
Lower energy consumption

The utilization of market-leading double conversion technology in Prestige UPS results in minimized losses and energy consumption. With an efficiency of up to 96%, this technology ensures optimal performance. The system completely isolates output power from all input power anomalies, providing 100% conditioned, perfect sine-wave output even in the face of severe power disturbances.

High efficiency produces less heat rejection, lower cooling costs, and reduced overall Total Cost of Ownership.

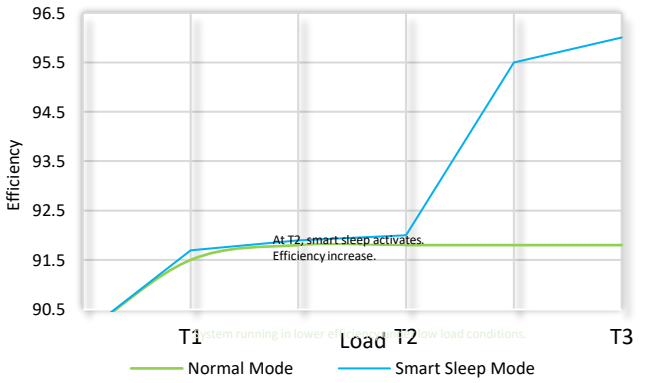
- 96.76% Efficiency at > 25% load (300 KW load on 1.2 MW)^
- 97.57% Efficiency at > 50% load (600 KW load on 1.2 MW)^
- 96.81% Efficiency at > 75% load (900 KW load on 1.2 MW)^
- 96.91% Efficiency at > 100% load (1000 KW load on 1.2 MW)^

^ Efficiency results are based on IEC62040-3 test reports of Prestige UPS (high efficiency model).



Optimized double conversion - Smart Sleep Function

The Smart Sleep function plays a crucial role in maintaining high efficiency, especially in scenarios where UPS load levels are typically low, such as in redundant UPS systems. This feature enables the optimization of power module load levels in a single UPS or parallel UPS systems by suspending excess UPS capacity. The outcome is an optimal online efficiency across all load levels. The technology is designed to withstand abrupt changes in load levels, and users have the flexibility to choose sleep mode and rotation periods. This allows power modules to operate on a rotational basis, thereby extending the overall lifespan of the system.



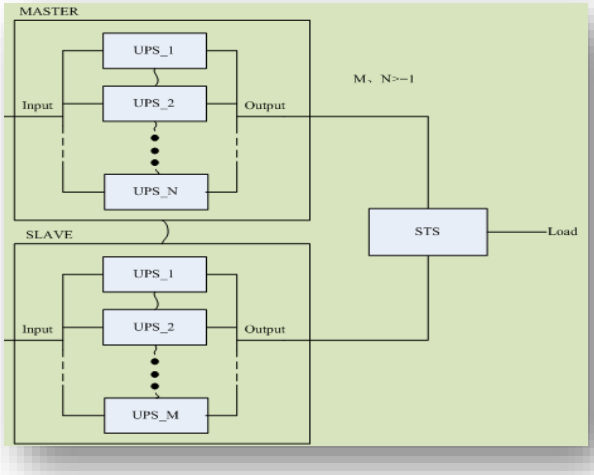
Achieving High Availability and MTBF *(Mean Time Between Failure)*

N+X Parallel Redundancy

The Prestige UPS series incorporates N+X Parallel Redundancy technology, allowing modules to be configured based on the desired protection level for connected equipment. The standard frame includes all essential accessories and devices for future expansion. Adding a new module is a straightforward process – it can be easily plugged into the system. The system automatically detects the paralleled modules and configures itself for parallel operations. This feature enhances flexibility and scalability while ensuring seamless integration of additional modules.

Load Bus Synchronisation (LBS)

The Load Bus Synchronization (LBS) serves the purpose of maintaining synchronization between the outputs of two independent UPS systems, whether they consist of a single unit or multiple units. This synchronization is upheld even when the two systems are functioning in different modes, such as bypass or inverter, or when operating on batteries. Typically, LBS is employed in conjunction with a Static Transfer Switch (STS) connected to the critical load, facilitating the realization of a Dual Bus configuration. This configuration enhances the reliability and resilience of the power supply system.



UPS Technical Specifications

PowerHub Prestige 300kW to 1000kW UPS Technical Specification (50kVA Power Module)							
MODEL(S)		Prestige 300K-TTME (50) Prestige 300K-TTMS (50)	Prestige 400K-TTME (50) Prestige 400K-TTMS (50)	Prestige 500K-TTME (50) Prestige 500K-TTMS (50)	Prestige 600K-TTME (50) Prestige 600K-TTMS (50)	Prestige 800K-TTME (50) Prestige 800K-TTMS (50)	Prestige 1000K-TTME (50) Prestige 1000K-TTMS (50)
Capacity (VA/Watts)	UPS cabinet	300k	400k	500k	600k	800k	1000k
	Power module	50k / 50k					
	Max. Number	6	8	10	12	16	20
INPUT							
Nominal voltage		380/400/415Vac					
Operating voltage range		138~305Vac for 40% load, 305~485Vac for 100% Load.					
Operating frequency range		40Hz ~ 70Hz					
Power factor		≥0.99					
Harmonic distortion (THDi)		≤ 3% (100% linear load)					
Bypass voltage range		Max Voltage: 220V +25% (Optional +10%, +15%, +20%); 230V: +20% (Optional +10%, +15%); 240V: +50% (Optional +10%) Min Voltage: -45% (Optional -10%, -15%, -20%, - 30%)					
Bypass Frequency range		±10%					
Generator input		Supported					
OUTPUT							
Rated voltage		380/400/415Vac					
Power factor		1					
Voltage regulation		±1%					
Output frequency	Line Mode	Synchronize with input, when the input frequency ＞±10% （±1%/±2%/±3%/±4%/±5% optional), output 50/60 (±0.1Hz)					
	Bat. Mode	(50/60±0.1%)Hz					
Crest factor		3:1					
Harmonic distortion (THDv)		≤2% with linear load ≤4% with non-linear load					
Efficiency		95.5% / 96.5% (high efficiency model)					
BATTERY							
Battery voltage	VRLA Battery	360Vdc~600Vdc (30~50pcs continuously adjustable, 30pcs default, 36~50pcs no power derating; 32~35pcs output power factor 0.9; 30/31pcs output power factor 0.8)					
	Lithium Battery	512Vdc					
Charge Current(A)		Power module 20A (Max.)					
SYSTEM FEATURES							
Transfer time		Utility to Battery : 0ms; Utility to bypass: 0ms					
Overload	Line Mode	≤110%, 60min; ≤125%, 10min; ≤150%,1min to bypass; ＞150%, shut down immediately					
	Bypass Mode	30℃: 135% overload for long term; 40℃: 125% overload for long term; >1000% overload for 100 ms					
Overheat		Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately					
Low battery voltage		Alarm and Switch off					
Self-diagnostics		Upon Power On and Software Control					
Backfeed protection		Supported					
EPO(optional)		Shut down UPS immediately					
Battery		Advanced Battery Management					
Noise suppression		Complies with EN62040-3					
Audio and Visual Alarms		Line Failure, Battery Low, Overload, System Fault					
Status LED & LCD display		Line Mode, Bypass Mode, Battery Low, Battery Fault, Overload & UPS Fault					
Reading on the LCD display		Input, Output, Battery, Command, Setting, Maintenance					
Communication interface		RS232, RS485, Parallel, LBS, BMS, Dry contact port, Relay card(optional), SNMP card(optional), Battery temperature sensor(optional)					
ENVIRONMENTAL							
Operating temperature		0℃ ~ 40℃					
Storage temperature		-25℃ ~ 55℃					
Humidity range		0 ~ 95% (non condensing)					
Altitude		< 1500m					
Noise		<68dB	<70dB	<70dB	<70dB	<73dB	<73dB
PHYSICAL							
Dimension WxD×H (mm)	UPS cabinet(TTME) UPS cabinet(TTMS)	600*850*1600	600*850*2000 / 1200*850*2000	1200*850*2000	1400*850*2000	2000*850*2000	2200*850*2000
	Power module	440×620×130					
Net weight (kg)	UPS cabinet	260	280/470	650	720	1080	1400
	Power module	34					
STANDARDS							
Safety		IEC/EN62040-1, IEC/EN62477-1					
EMC		IEC/EN62040-2 (IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8)					
Performance		IEC62040-3					

*TTME – UPS Cabinet with Maintenance MCCB Only
*TTMS – UPS Cabinet with Maintenance Bypass MCCB, Bypass MCCB and Output MCCB
Specifications are subject to chances without prior notice.

PowerHub

LITHIUM-ION BATTERY SYSTEM

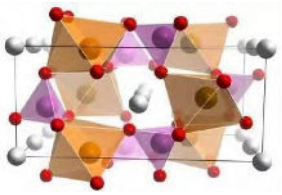
The Vision Revo TP2-00 stands as a dependable and modular solution, guaranteeing continuous 24/7 system uptime while delivering substantial total-cost-of-ownership (TCO) savings. This battery solution is composed of lightweight battery strings designed for seamless integration with a PowerHub Prestige UPS. The modular design enhances flexibility, allowing for efficient scalability and ease of maintenance, contributing to an overall cost-effective and reliable power management solution.

Product features

- Ensuring reliable and secure system operations is a top priority, with a comprehensive four-level safety protection mechanism at the cell, module, rack, and system levels.
- Achieving a high discharge rate of up to 10C, the system boasts an impressive discharge efficiency exceeding 95%.
- The system is equipped with all-state management, combining 100% cell management with precise control over functional components.
- Designed for longevity, the system has a targeted design life of 20 years, ensuring sustained and dependable performance.
- Demonstrating a robust cycle life, the system can withstand over 2500 cycles of 1C charging and discharging or more than 1000 cycles of 4C discharging and 0.5C charging.
- Featuring an intelligent cloud management system, the technology anticipates system status, supports operational and maintenance tasks, monitors cloud-based operations, and facilitates multi-role management.
- For enhanced safety measures, the system optionally includes a built-in intelligent fire protection control system, providing round-the-clock assurance for both system and facility safety.

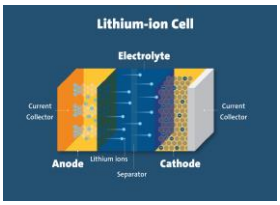
Functional Core of Lithium Battery System

Battery cells made of lithium iron phosphate, offering the utmost stability.



The lithium iron phosphate structure exhibits the highest stability; lithium iron phosphate has a high ignition point, excellent high-temperature performance, and possesses good safety characteristics.

The battery cell materials possess elevated levels of safety.

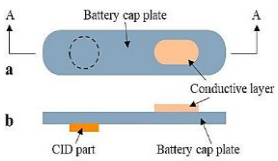


Electrolyte with low gas production and high safety; the physical isolation provided by the coating layer suppresses side reactions at the interface, enhancing material stability. The electronic insulation and automatic shutdown protection features of ceramic separators improve the high-temperature resistance and safety of lithium batteries.

Encapsulation of lithium iron phosphate cells in a square form.

High reliability is ensured, accompanied by elevated system energy efficiency. The system is relatively lightweight, boasting increased energy density. Its structure is straightforward, facilitating convenient expansion. With a substantial individual capacity, the system exhibits simplicity in composition, resulting in excellent stability.

CID (Current Interrupt Device) Safety Explosion-proof Valve



During abnormal usage of the battery cell, the CID plays a crucial role in preventing the potential safety hazard of the battery cell exploding and igniting. It stands as an integral element in ensuring the safety of the battery cell.

Cabinet BMS module

The Cabinet BMS, or CBMS, serves as the cabinet-level management system.

Features:

- CBMS is responsible for battery current detection, data collection, and analysis.
- Handles alarm and protection control for the system.
- Manages communication with upper and lower levels.
- Guarantees the oversight of the system's state and implements measures to protect against undesirable actions throughout the entire system.
- It addresses concerns such as overcharge, over-discharge, overcurrent, short circuit, and insulation detection.

Components of CBMS:

- Main circuit breaker
- Charging and discharging dual-circuit control switch circuit
- High-voltage isolation detection circuit
- Parallel processing circuit
- High-voltage power supply and DC starting circuit
- CBMS chassis

Safety and Reliability:

- CBMS plays a crucial role in ensuring the safety and reliability of the overall framework.

CBMS module

Battery module

The battery module, which contains a battery pack of cells, is the power source of the entire system. The battery module also has a fan for cooling the battery pack.

Integrated BMU Units:

- High-precision Battery Management Units (BMU) are integrated within each module.
- BMUs enable real-time monitoring and acquisition of module voltage and temperature.

Intelligent Control Features:

- Electric core-level intelligent temperature control.
- Intelligent balance function for battery cells.

System Improvement:

- Implementation of intelligent controls enhances system efficiency.
- Increases battery cycle life.

Module Design:

- Cold-rolled sheet metal shell design.
- Ensures high safety and reliability.

Stability and Immunity:

- Engineered for high stability and disturbance immunity.
- Guarantees safe and reliable operation when integrated into the overall battery cluster system.

Battery module

Lithium Battery System Technical Specifications

Rack Specification

Description	Specifications
Cell	3.2V50Ah
Series & Parallels	160S2P
Rated Voltage(V)	512
Rated Capacity(Ah)	100
Rated Energy(KWh)	51.2
Recommended Charging Current	20~50
Discharge cut-off Voltage(V)	448
Charge Voltage(V)	544 ~ 552
Cycle Life(@25℃, 0.5C/2C,100%DOD)	> 2500
Short-circuit Current(< 10ms)	Approx.9000
System Dimension(W* D* H)	(600*1000*2000) mm
Total Weight(Kg)	Approx. 900
Internal Resistance Fully Charged@ 25℃	≤60 mΩ
Thermal Management	Air Cooling
Charge Temperature	0 ~ 50 ℃
Discharge Temperature	-20 ~ 65℃
Operating Humidity	< 95%R.H.
Communication	CAN/RS485/TCP
System Parallels	≤15(GBMS)
Dry Contact	3 outputs, 1 input
Design life	15 years
Certification	
IEC62619, IEC60068,	IEC62619, IEC60068, UL9540A, UL1973, CE-LVD(EN62477+62040), CE-EMC(IEC61000-6-2)

Lithium battery system

Performance Data

Time(min)	10	15	30	45	60
Constant Power(kw)	250	200	101	68	51
Constant Current(A)	510	400	200	133	100

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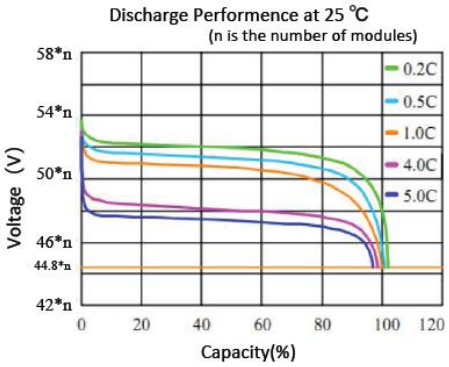
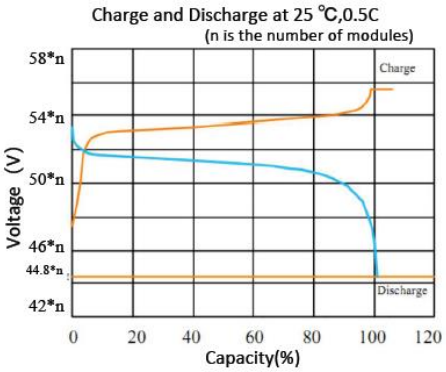
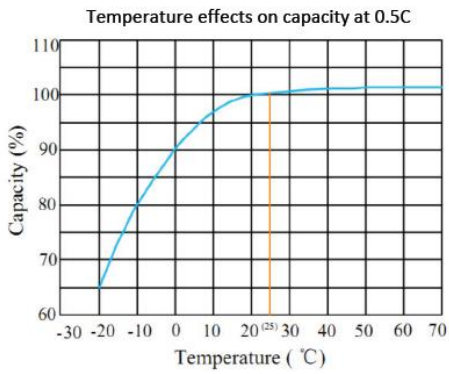
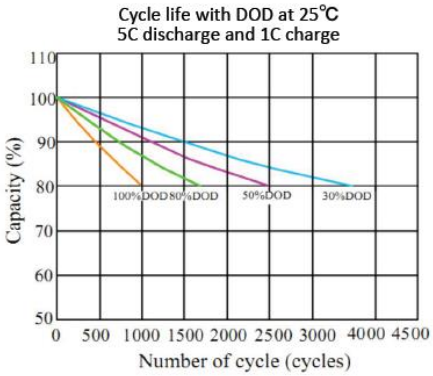
Characteristics Curve









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