



Modular Uninterruptible Power System
UPS5000-E (50-800 kVA) Series

HUAWEI TECHNOLOGIES CO., LTD.



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Modular Uninterruptible Power System **UPS5000-E (50-800 kVA) Series**

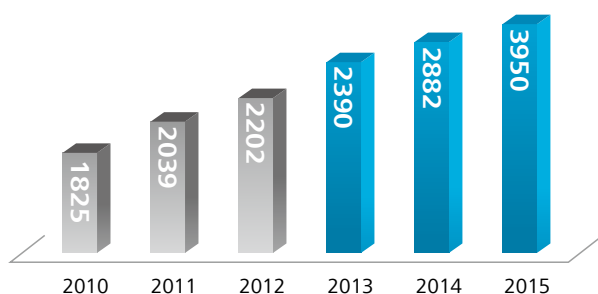


About Huawei & Network Energy

Corporate Information

Huawei is a leading global ICT solutions provider. Through our dedication to customer-centric innovation and strong partnerships, we have established end-to-end capabilities and strengths across the carrier networks, enterprise, consumer, and cloud computing fields. Our telecom network equipment, IT products and solutions, and smart devices are used in 170 countries and regions. With annual sales revenue of USD60.9 billion in 2015, Huawei ranked 228th on the Global Fortune 500. And in 2015 Huawei ranked 88th in the Interbrand's Top 100 Best Global Brands list. Together with our partners, we are building a better connected world.

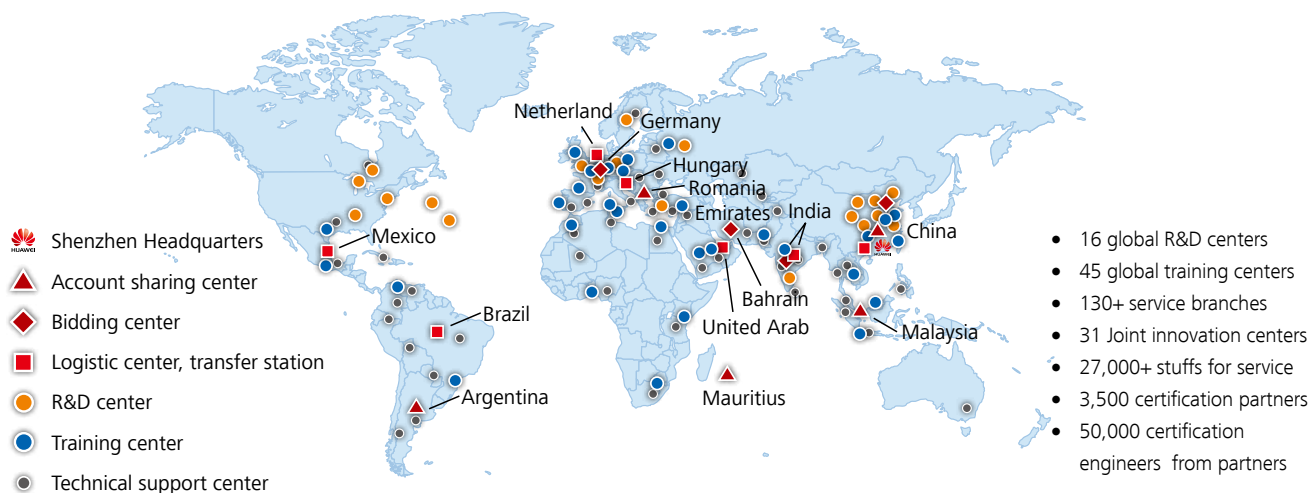
Sales revenue (USD billion)



Best Partners in Enterprise ICT

- Public Sector: 140+ countries including both government agencies and public sectors
- Finance Industry: 300+ financial institutions
- Grid Industry: 160+ power companies
- Transportation Industry: 180,000+ km highway & railway
- Internet Industry: 100+ famous Internet Companies Worldwide
- Finance Industry: 300+ famous Colleges & Universities Worldwid

Globalization, localization



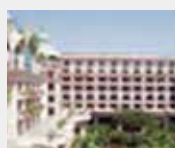
San Diego
USA



Dallas
USA



Moscow
Russia



Bangalore
India



Stockholm/Goteborg
Sweden



Munich
Germany

Huawei Network Energy

Network energy productline is one of seven main productlines in Huawei with its products covering fields including data center energy, telecom energy, and PV inverter. It concentrates on establishing simple, efficient, and reliable network energy so as to protect customers' long-term investment in energy field through helping them lay a solid foundation for excellent network.

At present, Huawei network energy productline owns 9 R&D centers, 520+ patent applications, 2000+ R&D personnel around the world. As far as the end of 2015, the booking revenue of the network energy productline had reached 2.8 billion US dollars.

By the end of 2015, Huawei network energy had deployed more than 1.8 million power systems globally and ranked first in global market shares. It has helped customers establish more than 660+ data centers and 15.5 GW smart PV plant globally.

- 2015 Huawei ranked first for modular UPS in China market shares (Released by CCID)
- 2015 Huawei ranked first for big power UPS over 200kVA in China market shares (Released by CCID)
- 2015 Huawei ranked first for prefabricated data center in world market shares (Released by IHS)
- Contribution Member of Green Grid
- 2015 Huawei ranked first for modular data center in China market shares (Released by ICTresearch)
- DCD Data Center "The blueprint Award", "Innovation Award" and "Green Data Center Award"
- Huawei UPS5000-E won "Excellent Data Center Product Award"
- Huawei UPS won Global first batch of "Energy Star" certification
- Uptime Founding Member

Network Energy Product

Data center facilities



Modular and prefabricated DC



UPS (1-800kVA)



Row/room level precision air conditioner (11-253kW)

Telecom power



Embedded power (30-400A)



Outdoor power (30-600A)



Indoor power (100-24000A)



Hybrid power

Solar Inverter



From 8kW to 50kW



Utility PV Plant



Commercial PV Plant

Intelligent management system



NetEco

UPS5000-E Overview



Rated Capacity: 50-800kVA (1-16 power module)
Rated Voltage: 380/400/415 Vac
Rated Frequency: 50/60 Hz
Type: Online, double-conversion, modular

Application scenarios:

- Financial datacenter
- Internet datacenter
- Disaster recovery datacenter
- Telecom central offices

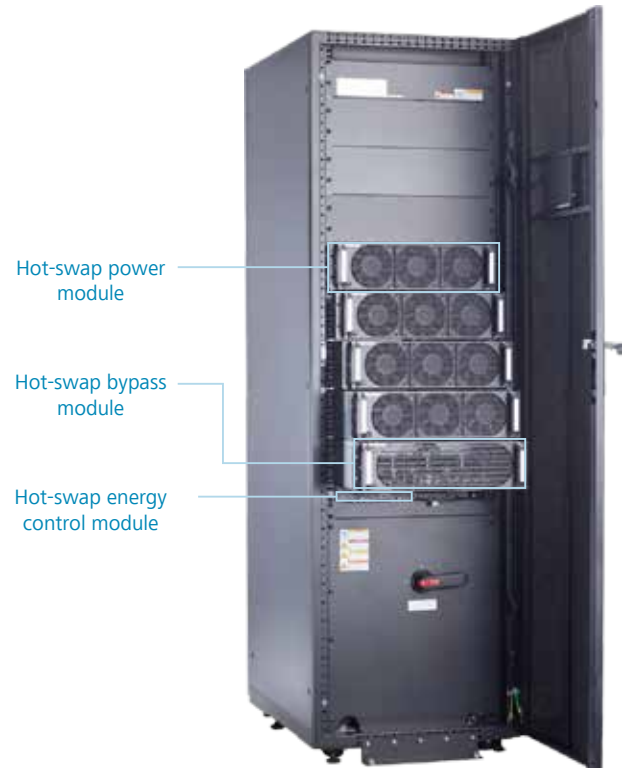


Customer Value: Simple Efficient Reliable

>> All hot-swap module design

Smooth capacity expansion

- To avoid power interruption risk in capacity expansion, the capacity of UPS system is planned large enough to meet the power demand in 3-5 years, which leads to low efficiency operation at the initial stage due to low load rate
- UPS5000-E uses module design and all of power module, bypass module, and control module support hot-swap, which makes smooth capacity expansion according to demand possible and reduces the initial investment



Online maintenance, reducing MTTR greatly

- Availability is used to weight the degree that a system, subsystem or equipment is in operable and committable state. It's positively related to MTBF (Mean Time Between Failures) and negatively related to MTTR (Mean Time To Repair)
- For traditional UPS, customers need seek help from the suppliers and long recovery time is required because in maintenance engineers need shutdown and dismantle the UPS, and replace the failure components or boards
- Hot-swap design makes the failure recovery time reduce greatly, and the system availability can be effectively improved as a result. The O&M engineers after trained can replace the failure module of UPS5000-E themselves in few minutes



Customer Value: Simple Efficient Reliable

>> Small footprint and easy construction



- High power density of up to 300kVA per cabinet, 50% footprint saving
- Front accessible maintenance
- 7 inches touch screen, easy to operate
- Top/bottom cable entry compatible

>> Intelligent battery management, extending battery lifespan



- Automatic switch between float charging and average charging and temperature compensation
- Battery hibernation design to avoid long-term float charging, which improves battery service time greatly
- Battery failure pre-alarm when its health grade is too low
- Flexible battery configuration: 30-46 batteries per string allow customers to get the faulty battery out instead of replacing it

>> Low investment on power distribution system

- THDi < 3% & input power factor > 0.99 reduce the pollution to power grid and lower the expense on power distribution components including cables, breakers, etc.
- Power walk-in technology boost the ratio of UPS capacity to D. G. capacity to 1:1.1 and cut the D. G. expense down



Customer Value: Simple Efficient Reliable

>> High efficiency at low load rate

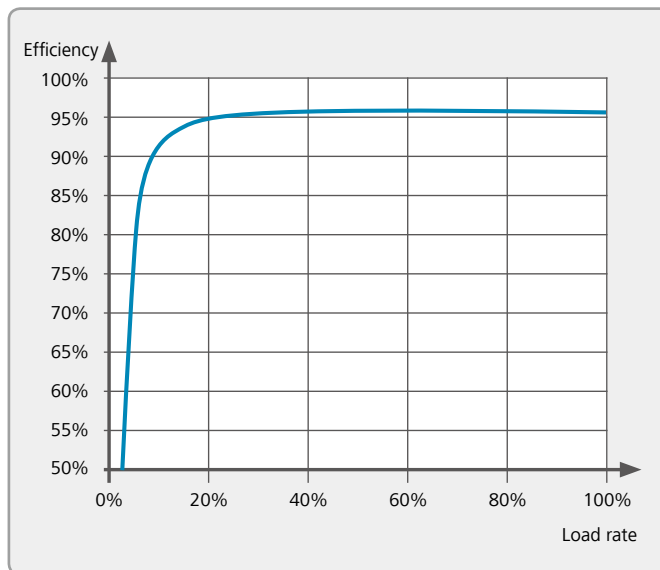
- Due to redundancy configuration to ensure reliability and excessive configuration at the initial stage to meet the power demand in 3-5 years, the UPS system of traditional datacenter often operates at load rate of 10%-40% and the operating efficiency is far below the value claimed. It's estimated that the UPS loss takes up 6%-10% of the total power consumption in datacenter

- Huawei UPS can keep high efficiency operation at low load rate: 96% at 40% rated load and 95% at 20% rated load

Given 200 kW load and air conditioner with a COP of 3:1

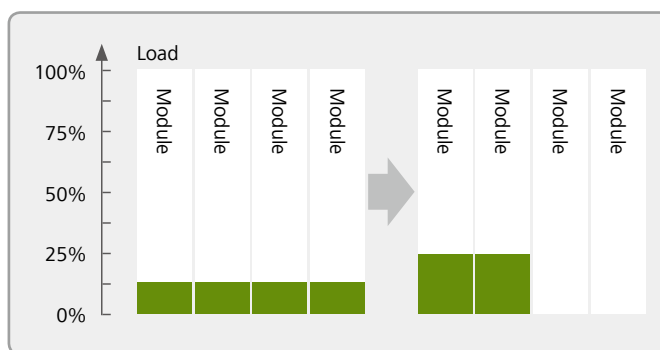
80, 183 kWh can be saved compared to traditional UPS
(92% efficiency)

257, 731 kWh can be saved compared to legacy UPS
(86% efficiency)



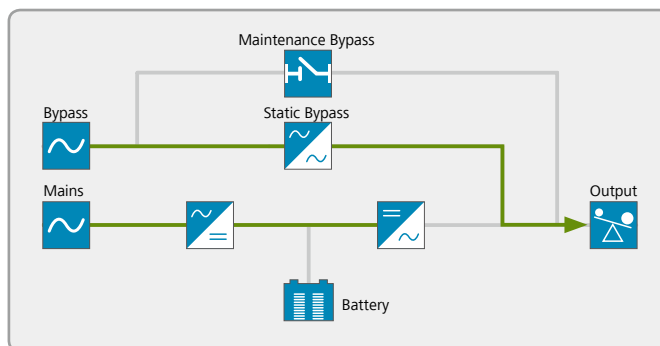
>> Intelligent hibernation design

- When the load rate is very low (below 10%-15%), intelligent hibernation can be enabled and some power modules will switch to "standby" state to boost load rate and improve operating efficiency
- To ensure reliability, at least one power module serves as redundancy module and when load increases dramatically, the sleep module will be awakened instantly



>> Achieving 99% efficiency at ECO mode

- In good grid area, ECO mode can be enabled to improve efficiency to more than 99% and the maximal energy-saving can be achieved
- At ECO mode, the load is powered by static bypass (the allowable input range can be set) and the inverter is in "standby" state
- When input abnormality occurs, UPS5000-E will transfer to online mode in several milliseconds to ensure power continuity and quality



Customer Value: Simple Efficient **Reliable**

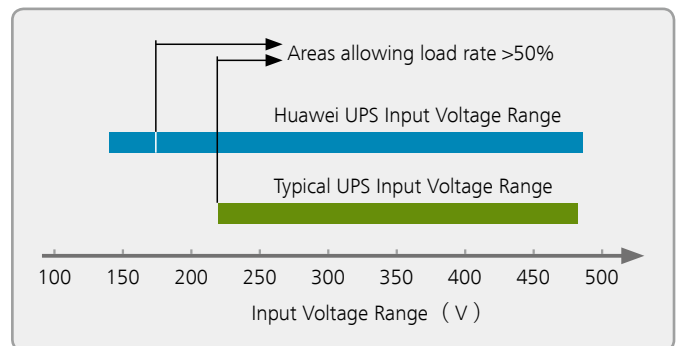
>> Redundancy design

- Redundancy design for energy control unit, communication buses to eliminate single point of failure
- Fault-tolerant design for fan system: 30% load can be driven when 2 fans fail and 50% load when 1 fan fails



>> High grid adaptability

- 138-485 Vac wide input voltage range to minimize battery use: 485-305Vac for 100% load; 305-138 Vac for 100%- 40% load (derating linearly)
- 6 kV/5 kA lightning protection design, reducing lightning-related failure rate

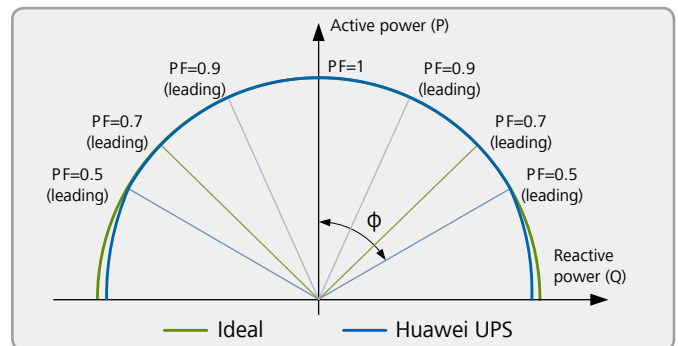


>> High load adaptability

- High output power factor of up to 1, 25% more load driven than traditional UPSs

The application of PFC technology in modern IT devices like servers, storages, routers improves the input power factor to more than 0.95. And if they are powered by UPS with output power factor of 0.7-0.8, the investment on UPS will increase remarkably

- No derating for capacitive or inductive devices with a PF>0.5



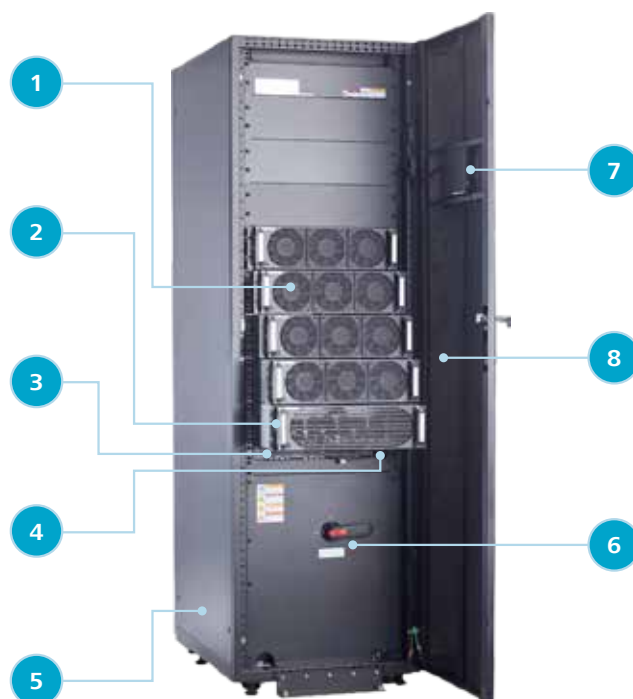
>> High environment adaptability

- No derating at 40°C to ensure power continuity
- Conformal coating on PCB, improving adaptability to dusty or salty spray environment



UPS5000-E Composition

- 1 50kVA power module
- 2 Static bypass module
- 3 Energy control module
- 4 Monitoring unit with built-in SNMP and RS485
- 5 Mechanical frame
- 6 Maintenance bypass switch
- 7 7-inch Liquid Crystal Display (LCD)
- 8 Dust-proof net



50-300kVA



UPS5000-E Composition

>> Power module

The Power module with rated capacity of 50 kVA/kW can eliminate all the nine common problems in public grid and output pure and stable sine wave.

Its dimensions are 130 mm (H) x 442 mm (W)x 620 mm (D).



>> Bypass module

The bypass module can provide continuous power supply to load when overload. The bypass module of UPS5000-E features concentrated design.



>> Energy control module

The ECM supports intra-rack parallel CAN communication and inter-rack parallel CAN communication. The intra-rack loadshare control and inter-rack loadshare control are isolated at ECM to achieve better expandability.



>> iBox/iBat

Supports wireless transmission and voltages, resistance, and temperatures detection of single cell.



>> Dry contact card

The dry contact card allows the UPS to control and monitor the switch state of BCB box and implement EPO.



>> Dry contact extended card (Optional)

The dry contact extended card provides five relay dry contact outputs and five signal input ports. The card implements additional alarm and control functions to meet customer requirements.



>> Backfeed protection card (Optional)

The backfeed protection card sends signals to trigger alarm signals or quickly disconnect the feedback loop.



>> Battery ground fault detector (Optional)

The battery ground fault detector detects battery ground fault and sends alarm signals when the ground leakage current exceeds the threshold value.

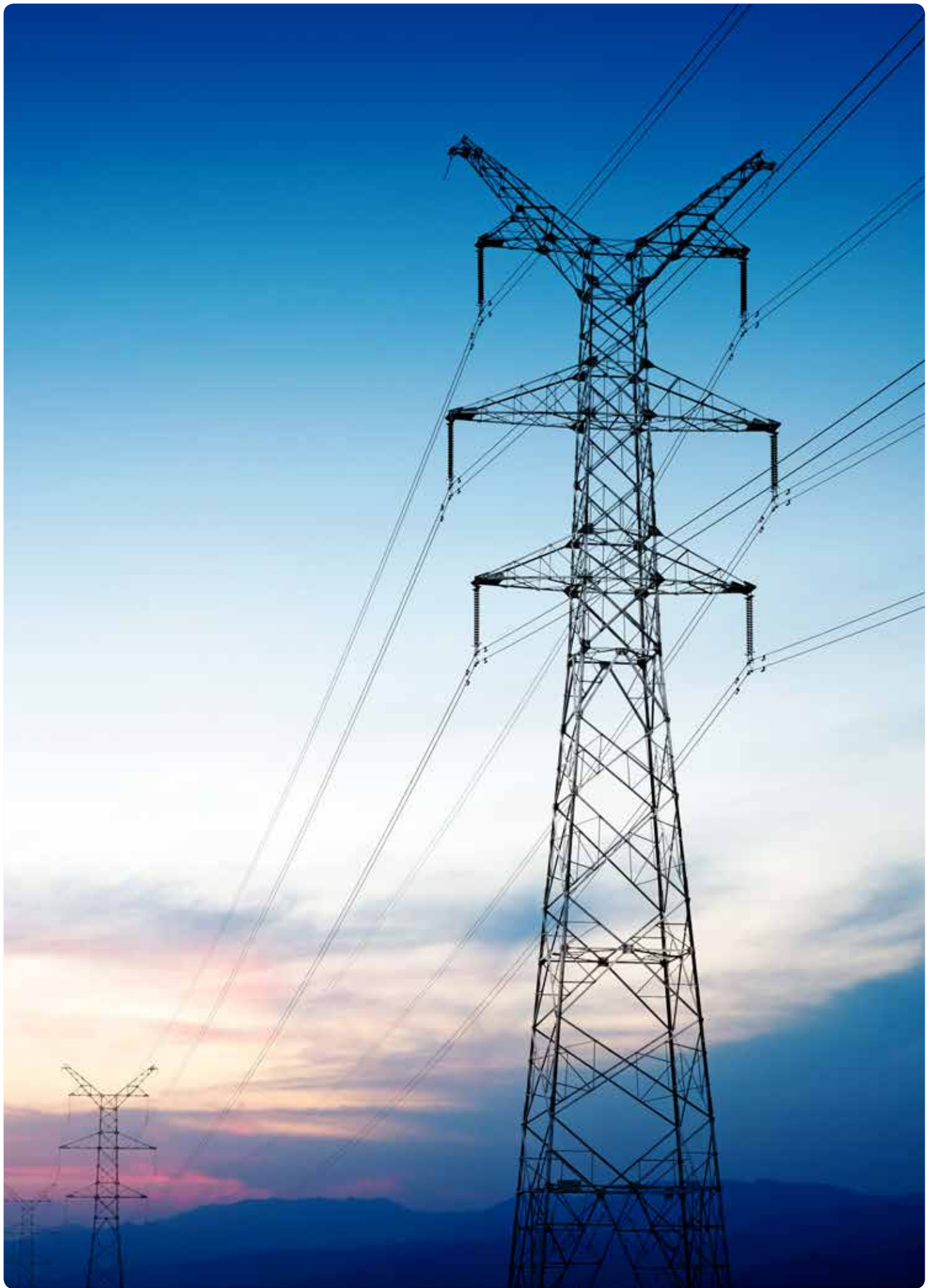


Other Optional Components

Component	Function
Antiseismic kit	Reinforces the cabinet so that the cabinet meets the requirements of 9 degree seismic fortification intensity.
IP21 component	Prevents water from dropping into the cabinet, protecting the cabinet to IP21.
Top outlet kit	If you need to install the cabinet against the wall, install a top outlet kit to meet heat dissipation requirements. It's suitable for 40-200kVA.
ECM extended subrack	Install this subrack when the UPS5000-E is equipped with a backfeed protection card and dry contact extended card.
Cable entry cabinet	Install an entry cabinet to meet the requirements for routing cables if needed.
Ambient temperature and humidity sensor	Battery temperature sensor can detect the battery temperature and provide reference for temperature compensation when float-charging.
Battery temperature sensor	Feeds back real-time temperature and humidity data to dynamic environment monitoring system.

Technical Data

Model		UPS5000-E-200K-SM/FM	UPS5000-E-300K-SM/FMT	UPS5000-E-400K-SM/FM	UPS5000-E-500K-SM/FM	UPS5000-E-600K-SM/FM	UPS5000-E-800K-SM/FM
Rated Capacity (kVA/kW)		50-200	50-300	50-400	50-500	50-600	50-800
Number of Power Modules		1-4	1-6	1-8	1-10	1-12	1-16
Input							
Mains	Input Wiring	3Ph+N+PE					
	Rated Voltage	380/400/415Vac					
	Voltage Range	138-485 Vac (305-485 Vac for 100% load; 138-305 Vac for 40%-100% load)					
	Input Frequency	40-70 Hz					
	Total Harmonic Distortion	THDi<3% for linear load, THDi<5% for nonlinear load					
	Input Power Factor	0.99					
Bypass	Rated Voltage	380/400/415 Vac					
	Input Frequency	50/60 ± 6 Hz					
Battery	Rated Voltage	360-552 Vdc (The number of batteries can be selected from 30 to 46; 40 batteries in default)					
Output							
Output Wiring		3Ph+N+PE					
Voltage		380/400/415 Vac ± 1%					
Frequency		Tracking the bypass input (Online mode); 50/60 Hz ± 0.05% (Battery mode)					
Waveform		Sine wave (THDv<1% for linear load)					
Overload Capacity		Inverter: 110% overload for 60 min; 125% overload for 10 min; 150% overload for 1 min Bypass: 135% overload for long term; >1000% overload for 100 ms					
System							
Output Power Factor		1					
Efficiency		96%					
Expandability		Up to 8 units connected in parallel					
Cable Entry Route		From the top or from the bottom					
Environment							
Operating Temperature		0-40℃					
Storage Temperature		-40-70℃					
Relative Humidity		0%-95% (No condensing)					
Maximum Operating Altitude		1000 m. Above 1000 m, derating 1% for each additional 100 m					
Audible Noise		< 65dB		< 68dB	< 70dB		
Others							
Height × Width × Depth(mm)		2000 × 600 × 850		2000 × 1200 × 850		2000 × 1400 × 850	2000 × 2400 × 850
Weight		227-293kg	227-359kg	253-480 kg	693-1050 kg	1045-1350 kg	1185-1670 kg
Certifications		YD/1095-2008;EN/IEC 62040-1; EN/IEC 62040-2; EN/IEC 62040-3; TLC;CE; CB; RoHS, REACH, WEEE, etc.					
Communications		Dry contacts, RS485, SNMP					







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HUAWEI TECHNOLOGIES CO., LTD.

Huawei Industrial Base
Bantian Longgang
Shenzhen 518129, P.R. China
Tel: +86-755-28780808
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www.huawei.com