



Battery Integrated Uninterruptible Power System
UPS5000-E (25-75 kVA) Series

HUAWEI TECHNOLOGIES CO., LTD.



CONTENTS

- 02 Solution Overview
- 03 Customer Benefits
- 09 System Architecture and Key Components
- 12 Typical Configuration
- 13 System Parameters
- 14 Global Services



Solution Overview

UPS5000-E Battery Integrated Solution

Rated capacity: 25-75 kVA



UPS5000-E-75K-BF

The three-phase uninterruptible power supply solution is applicable to small- and medium-sized data centers or high-density areas. The integrated UPS adopts online double conversion design and power modules with a leading efficiency of 96.5%. The UPS is fully modular with hot-swappable modules. Redundancy is also supported.

- UPS and batteries integrated in one cabinet
- Modular and redundant
- Efficient double conversion technology, module efficiency 96.5%
- High power density design
- 1.0 output power factor (kVA = kW)
- Front maintenance, can be installed against a wall
- Battery module hot-swappable
- Battery module fault displayed locally



Customer Benefits:

Simple · Efficient · Reliable

01

All Modular Design

Simple installation: Site survey and battery wiring are not required.



Huawei battery integrated UPS

VS

Professional installation, complex wiring, long labor hours



Traditional battery rack solution

The power module, bypass module, battery module, and control module all use modular and integrated design. Compared with traditional UPS and battery rack solutions, the integrated UPS is installed by inserting modules onsite and does not require site survey or wiring. A common engineer can finish installation and wiring, greatly reducing labor hours for site installation and wiring.

02

Battery Modular Pre-integration



- Batteries pre-integrated before delivery
- Hot-swappable terminals
- Wiring not required onsite

03

Simple Maintenance

Power module



Battery module



Bypass module



Control module



The power module, battery module, bypass module, and control module are all hot-swappable. Online maintenance is supported. A common engineer can finish replacement and maintenance in 5 minutes.

04

Intelligent Battery Management Without Manual Inspection



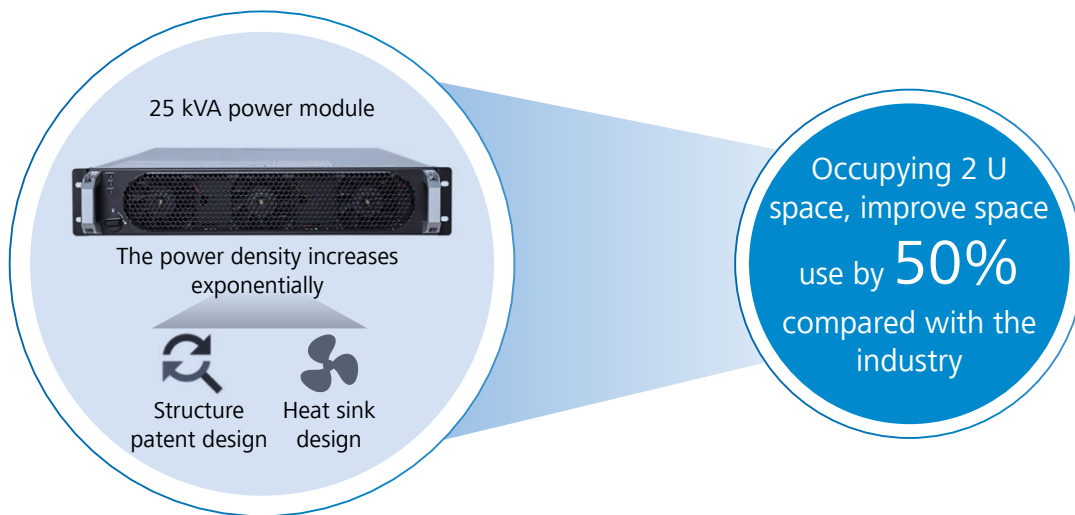
- Battery module overtemperature alarm
- Fuse blown for protection if battery module is abnormal
- Fault displayed locally, easy to locate the faulty module
- Intelligent equalized charging, float charging, and temperature compensation
- Battery hibernation can be enabled, preventing battery lifespan from being shortened due to long-time float charging

Customer Benefits:

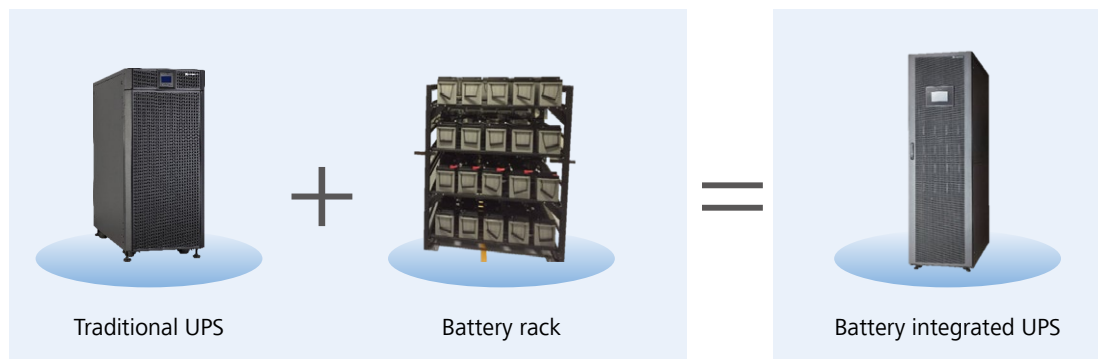
Simple · Efficient · Reliable

01 Space Saving

>> Power Module: High Power Density



>> Highly Integrated, Saving Footprint



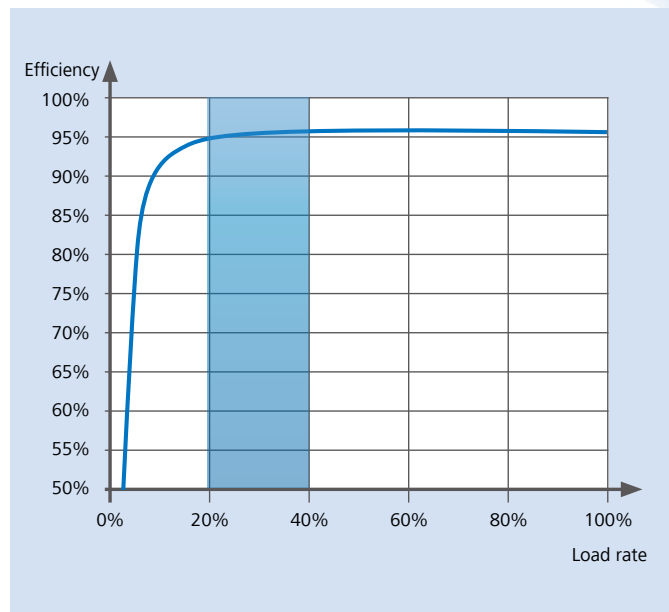
Huawei battery integrated solution saves **50%** footprint compared with a traditional solution.

02

Efficient and Energy-saving

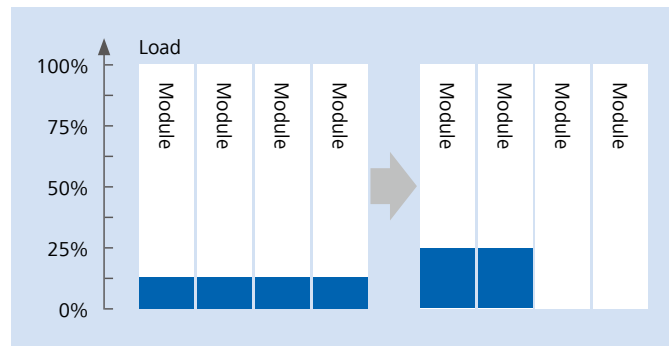
>> >> High efficiency at low load rate

- 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



>> 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 awaked instantly



Customer Benefits:

Simple · Efficient · Reliable

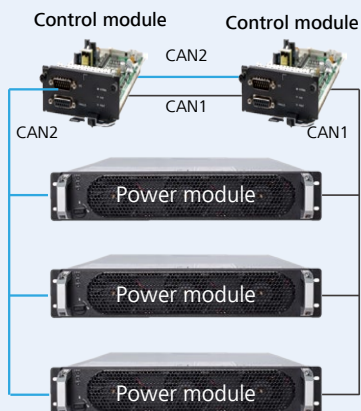
01

Redundancy Design, Eliminating Single Point of Failure

- 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

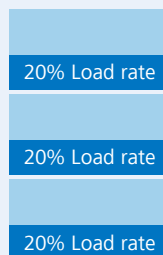


Dual communication system design, single bus system failure, will not affect the normal operation of the system.

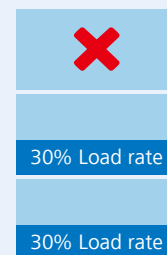


Power module redundancy design, a single power module failure, will not affect the normal operation of the system.

3 power module running



2 power module running



Fan fault tolerance design, Single fan faults with load 50%, two fan faults with load 30%

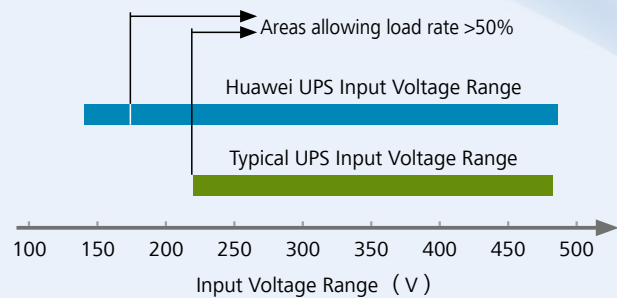


02

Strong Adaptability in Power Grid, Load & Environment

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

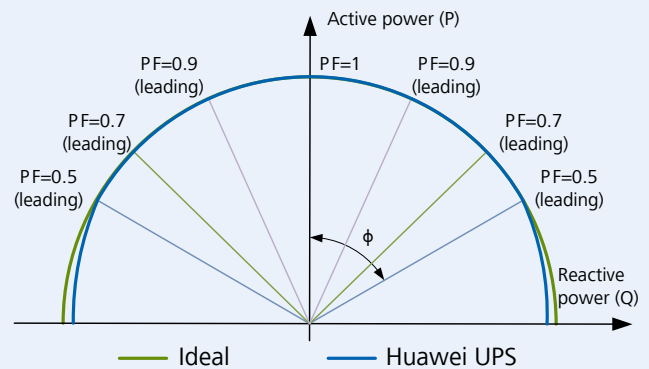


High load adaptability

- 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

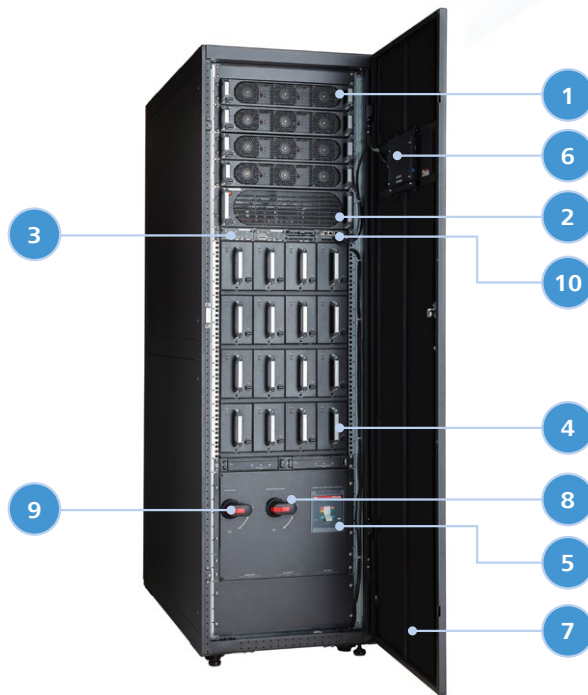


System Architecture and Key Components

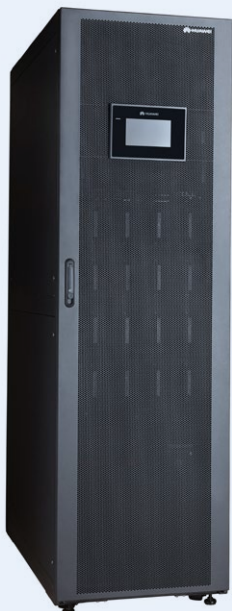
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System Architecture and Composition

- 1 25 kVA power module
- 2 Static bypass module
- 3 Monitoring module
- 4 Battery module
- 5 Battery switch
- 6 LCD
- 7 Air filter
- 8 Maintenance bypass switch
- 9 Input switch
- 10 Monitoring unit (SNMP and RS485 communications in standard configuration)



Dimensions: 600 mm x 1200 mm x 2000 mm



02

Key Components

Power module

The Power module with rated capacity of 25 kVA/kW can eliminate all the nine common problems in public grid and output pure and stable sine wave.

Dimensions (H x W x D): 86 mm x 442 mm x 620 mm



Bypass module

The bypass module can provide continuous power supply to load when overload. The bypass module of UPS5000-E features concentrated design and maximum output power 128kW.

Dimensions (H x W x D): 130 mm x 442 mm x 620 mm



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.



Battery Module

A battery module consists of ten B.B. 9 Ah batteries. An alarm will be generated if the battery module temperature is abnormal and the fuse will be blown for protection if the battery module is abnormal. If there is a fault, the fault indicator turns on locally.

Dimensions (H x W x D): 160 mm x 108 mm x 786 mm



System Architecture and Key Components

03

Key Components (Optional)

Battery Cabinet

The battery cabinet meets the long-time power backup requirements. Each battery cabinet can house eight battery strings (each string contains four battery modules) and is equipped with a battery switch. A maximum of four battery cabinets can be connected.

Dimensions (H x W x D): 2000 mm x 600 mm x 1200 mm



>> 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.
Battery temperature sensor	Feeds back real-time temperature and humidity data to dynamic environment monitoring system.
BSC cable	Transmits bus synchronization signals in a dual-bus system.

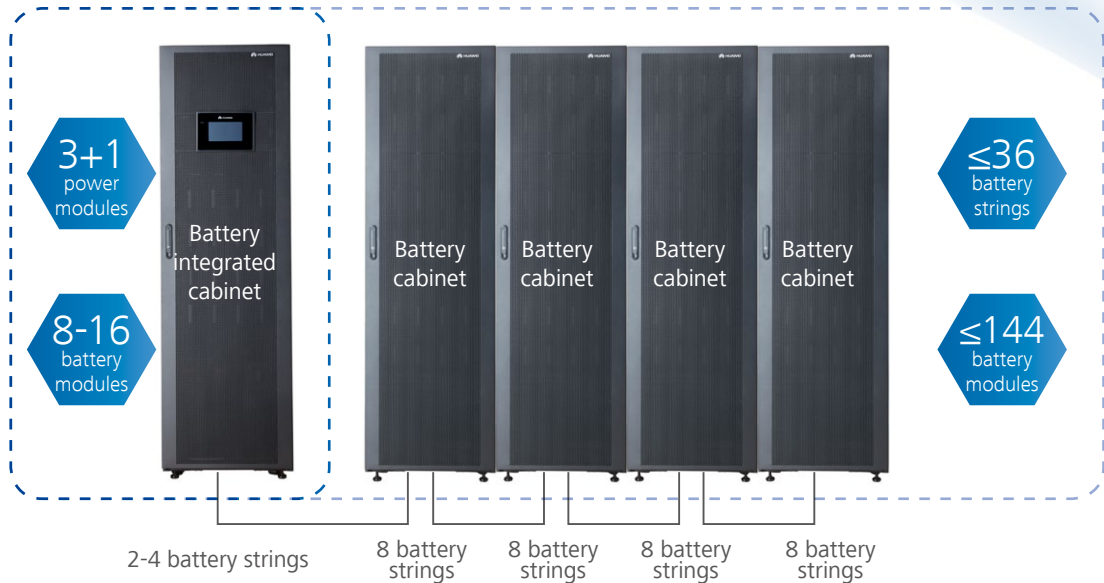
Typical Configuration

01

Configuration scene

Typical Configuration

Long-time Power Backup Configuration



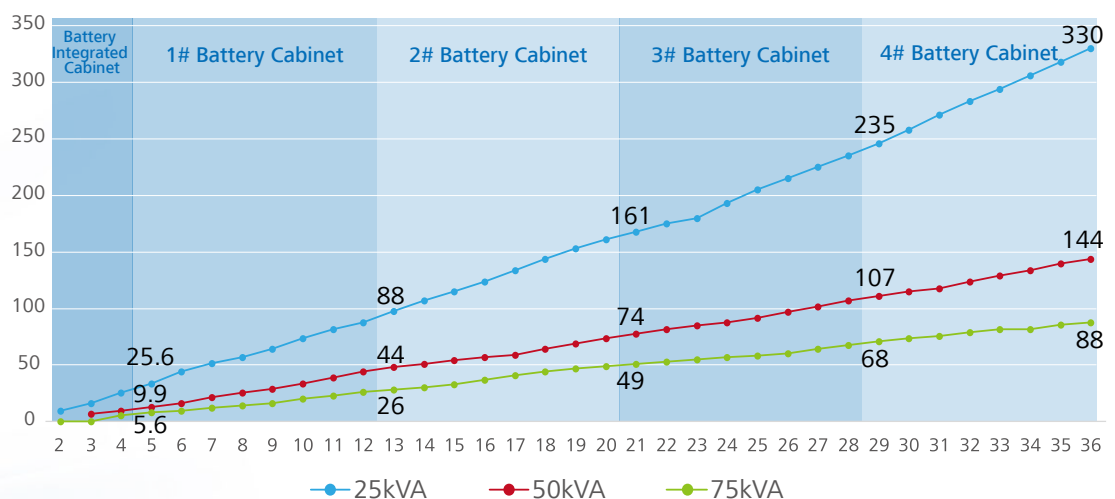
Battery integrated cabinet: One to three 25 kVA power modules, a maximum of four power modules can be configured with one module redundant.

Battery module: One battery module contains ten B.B. 12 V 9 Ah batteries and one battery string contains four battery modules.

Battery cabinet: Supports a maximum of eight battery strings, that is, 32 battery modules.

>> Backup Time Table

Unit: min



System Parameters

Model			UPS5000-E- (25-75kVA) -BF		
Capacity (kVA/kW)			25kVA/kW	50kVA/kW	75kVA/kW
Input	Mains	Rated Voltage	380/400/415Vac		
		Voltage Range	138 to 485Vac		
		Input Wiring	3Ph+N+PE		
		Frequency Range	40 to 70 Hz		
		Total Harmonic Distortion	<3% (100% linear load)		
		Input Power Factor	0.99		
	Bypass	Rated Voltage	380/400/415Vac		
		Frequency Range	50/60Hz (adjustable, 0.5 to 6Hz, ± 2Hz by default)		
		Input Wiring	3Ph+N+PE		
Output	Rated Voltage		380/400/415Vac		
	Output Frequency		Tracking the bypass input (Normal mode); 50/60Hz ± 0.05% (Battery mode)		
	Output Power Factor		1		
	Waveform		Sine wave; THDv<1% (linear load)		
	Output Wiring		3Ph+N+PE		
	System Efficiency		96%		
	Overload Capacity		≤110% overload for 60min; ≤125% overload for 10min; ≤150% overload for 1min		
Environment	Operation Temperature		0 to 40 °C		
	Storage Temperature		-40 to 70 °C		
	Relative Humidity		0% to 95% (No condensing)		
	Maximum Operation Altitude		0 to 1000m. Above 1000m, derating 1% for each additional 100m		
	Noise		65dB		
Others	Integrated Cabinet Power Backup		Standard configuration 1 to 4 groups of battery (4 to 16 battery modules)		
	Battery Cabinet (optional) Power Backup		Optional battery cabinet, 1 to 8 groups of battery (4 to 32 battery modules) per cabinet, max. 4 cabinets in parallels		
	Battery Module		Hot swappable design. Support battery or empty battery for battery module, battery typical configuration: 10 × 12V 9Ah		
	Height × Width × Depth (mm)		2000 × 600 × 1100		
	Weight		747.4kg	766.5kg	785.6kg
	Certifications		EN/IEC 62040-1, EN/IEC 62040-2, EN/IEC 62040-3, CE, CB, etc.		
	Communications		SNMP, RS485, Dry contacts etc.		

Global Services

Huawei has professional UPS service engineers deployed globally, providing global technical support with rapid response speed. Huawei provides customized services that include:

- 7*24 remote support
- Software support
- Active prevention
- Hardware support
- Onsite support
- Others

140+ countries

129+ national spare parts centers

300+ regional warehousing centers

22,000+ servers

24*7 online service







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