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Power ICT in a Smart Way

FusionModule2000 Smart Modular Data Center

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HUAWEI

Modular Data Center

FusionModule2000 Smart Modular Data Center

Introduction

HUAWEI FusionModule2000 is a new generation smart modular data center solution with complete integration of cabinets, power supply and distribution systems, cooling systems, cabling systems, management software, and other subsystems. It supports flexible deployment with single or dual row, cold or hot aisle containment. The maximum IT power can be up to 21kW/rack.

FusionModule2000 (Dual-row)

Application Scenarios

- Single module is applied to small or medium data center (total IT load≤128kW, area≤500m^2), also applied to large data center for branch office of big enterprise.
- Multiple modules can be used to construct a large data center to meet large enterprise data center requirements, such as government, education, healthcare, finance, telecom industries data center etc.

FusionModule2000 (Single-row)

Features & Value

Reliable

- Dehumidifying at low load rate down to 10%, ensuring the safe operation of IT equipment
- Excellent environment adaptability, stable operations under extreme conditions
- Pre-alarm of circuit breaker terminal with temperature monitoring, batteries auto-shutdown for fire protection, power-off rate reduced by 50%

Efficient

- Closely coupled cooling, efficient power system, PUE down to 1.45 (Real test in Shenzhen)
- Aisle containment, separated hot and cold air, eliminating hotspots
- Integrated high efficiency UPS power system

Simple

- Standardized devices, modular architecture, on-demand deployment
- Integrated power supply and distribution, space saving by 1-2 IT racks
- Remote and local intelligent management, mobile O&M, simple and convenient

Specifications

Item	Specifications	
System	Dimension	Single-row with aisle containment (L×W×H): L×2400×2000mm, L≤15 m L×2300×2000mm, L≤15 m L×2400×2200mm, L≤15 m
		Dual-row with aisle containment (L×W×H): L×3600×2000mm, L≤15 m L×3400×2000mm, L≤15 m L×3600×2200mm, L≤15 m
	Cabinet number per module	Single row: 2-24; Dual row: 6-48
	Power supply	380/400/415Vac, 50/60Hz, 3Ph+N+PE
	IT power consumption per module	N+1 maximum support 112kW 2N maximum support 128kW
	Maximum power per rack	21kW/R
	Operation condition	T1 condition: outdoor-40°C to +45°C (indoor5°C-45°C) T3 condition: outdoor-20°C to +55°C (indoor5°C-45°C)
	Availability	Tier II or Tier III (up to Tier IV)
	Altitude	0-1000m (derating above 1000m)
	Installation	Installing on concrete floor or raised floor
Cabinet	Dimensions (H×W×D)	2000mm×600mm×1200mm 2000mm×600mm×1100mm 2200mm×600mm×1200mm
	Space available	42U/47U
	Protection level	IP20
Air-cooled In-row air conditioner	Cooling capacity	25kW/35kW
	Dimensions (H×W×D)	2000mm×300mm×1100mm 2000mm×600mm×1100mm
	Power supply	25kW air conditioner: 380V AC~415V AC 50/60Hz, 3Ph+N+PE 35kW air conditioner: 380V AC~480V AC 50/60Hz, 3Ph+N+PE
	Refrigerant	R410A
Chilled water In-row air conditioner	Cooling capacity	30kW
	Dimensions (H×W×D)	2000mm×300mm×1200mm
	Power supply	200~240V (1Ph, 50/60Hz)
	Refrigerant	Water/Ethylene Glycol
Integrated UPS (UPS inside)	Input voltage	380/400/415Vac, 50/60Hz, 3Ph+N+PE
	Input power factor	Full load > 0.99, Half load > 0.98
	Rated capacity	40~160kVA
	Efficiency	≥ 96%
	AC SPD	20kA, 8/20μs
Integrated power distribution cabinet (UPS outside)	Input voltage	380/400/415Vac, 50/60Hz, 3Ph+N+PE
	Rated capacity	IT: 250A, Air conditioner: 160A
	AC SPD	20kA, 8/20μs

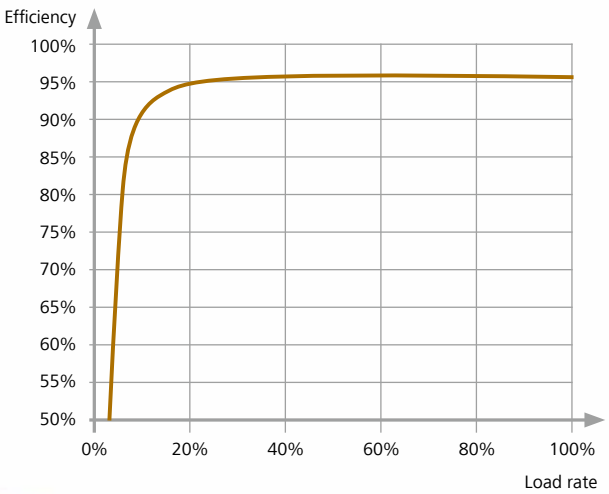
Integrated UPS

Introduction

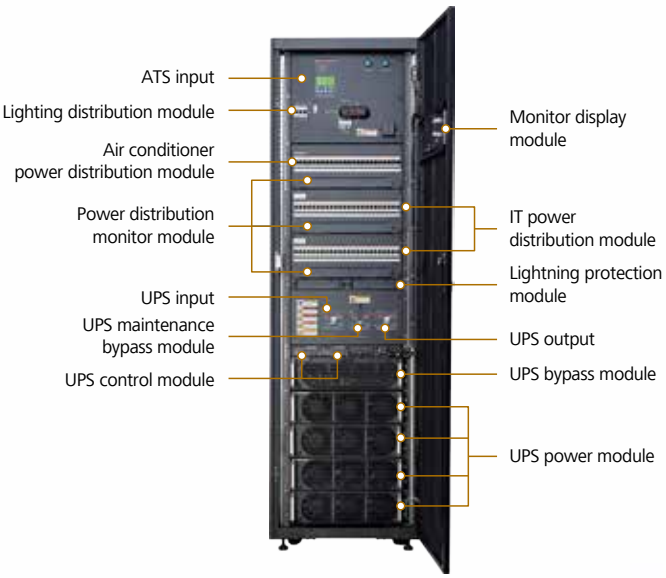
Integrated UPS developed by Huawei is a new generation of high integration power system in a cabinet which is suitable for modular data center. It includes UPS power, IT power distribution, air conditioner power distribution, lighting power distribution, ATS, UPS input power distribution and UPS output power distribution. And it features easy to maintenance, high reliability and high efficiency.

Features & Value

- 160kVA integrated UPS power system, leading power density in industry
- UPS and PDF are merged in one cabinet, shorten the installation time by 50%, compact design, space saving by 1-2 IT racks
- Intelligent detection of brand circuit, improving the ability of continuous power supply
- Sensible temperature of switch wiring terminal, proactive prevention of local hot spot
- Pre-alarm of circuit breaker terminal with temperature monitoring, batteries auto-shutdown for fire protection, power-off rate reduced by 50%



UPS Efficiency curve



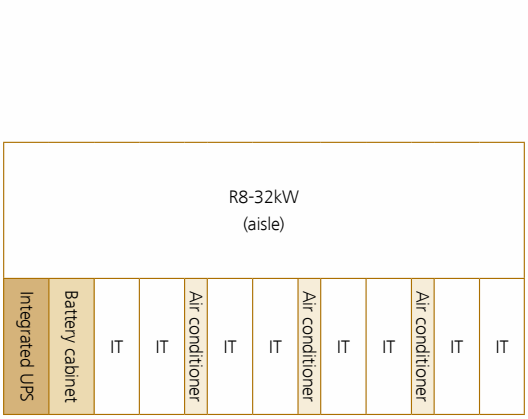
Specifications

Item	Specifications			
Input	Rated input voltage	380/400/415Vac, 50/60Hz, 3Ph+N+PE		
	Input voltage range	80V AC-280V AC (single phase) (80VAC-176V AC, load linear derating)		
	Input frequency range	40Hz-70Hz		
	Input power factor	Full load > 0.99, Half load > 0.98		
Output	Rated voltage	380/400/415Vac, 50/60Hz, 3Ph+N+PE		
	Voltage distortion (linear load)	THD ≤ 1%		
	Voltage distortion (nonlinear load)	THD ≤ 4%		
	Power factor	1		
	Maximum load peak factor	3:1 (meet IEC 62040-3)		
System	Efficiency	≥ 96%		
	Module current imbalance index	Parallel current imbalance < 5%		
	Connection mode	Upper inlet and upper outlet		
	AC SPD	20kA, 8/20μs		
Configuration	Rated capacity	40-160kVA		
	Input mode	MCCB/ATS, single route or double route		
	Input specification	160A	250A	400A
	IT power distribution	40A/1P×18; 63A/1P×6	40A/1P×18×2; 63A/1P×6×2	
	Air conditioner power distribution	40A/3P×3; 63A/3P×1	40A/3P×6; 63A/3P×2	
	Lighting power distribution	10A/1P×3		
Dimensions	2000mm×600mm×1100mm			

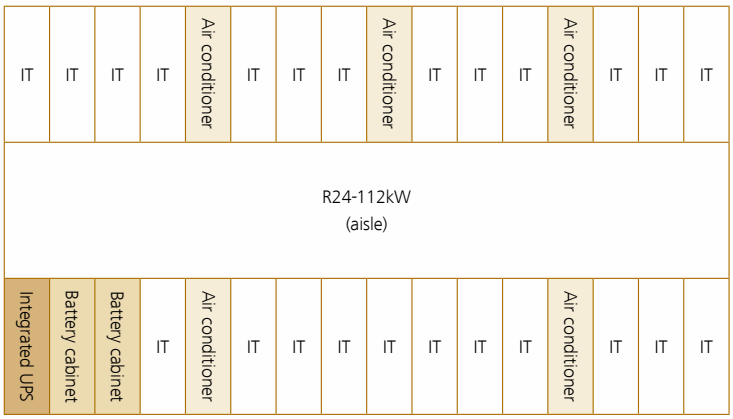
Typical Configurations——UPS Inside

Single-row cabinet scenario

Dual-row cabinet scenario



R8 single row module typical layout



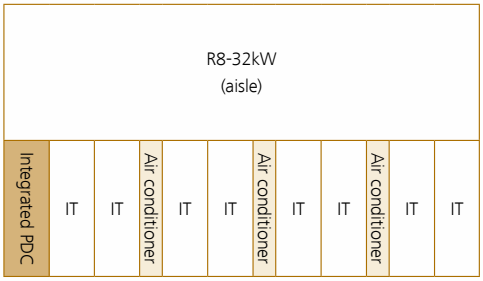
R24 dual row module typical layout

IT power (kW)	Qty of IT racks	Max. power density (kW)	Qty of air conditioner	Redundancy	Aisle width (mm)
20	5~11	4	25kW×2	N+1	1200
40	5~11	7	25kW×3	N+1	1200
60	5~23	7	25kW×4	N+1	1200
80	7~23	7	25kW×5	N+1	1200
100	9~23	7	25kW×6	N+1	1200
112	12~24	7	35kW×5	N+1	1200

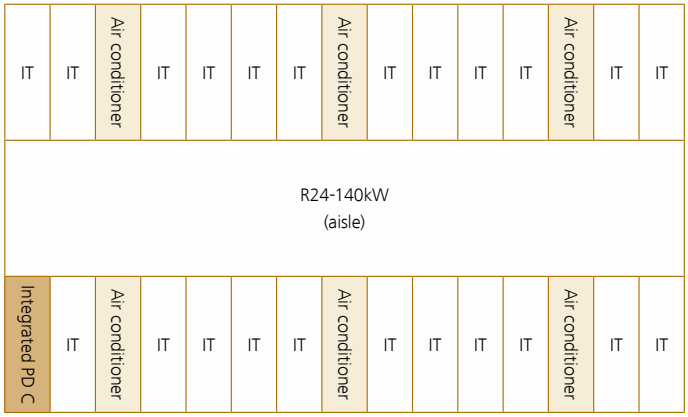
Typical Configurations——UPS Outside

Single-row cabinet scenario

Dual-row cabinet scenario



R8 single row module typical layout



R24 dual row module Typical layout

IT power (kW)	Qty of IT racks	Max. power density (kW)	Qty of air conditioner	Redundancy	Aisle width (mm)
20	5~23	4.2	25kW×2	N+1	1200
40	5~23	7	25kW×3	N+1	1200
60	5~23	7	25kW×4	N+1	1200
80	7~23	7	25kW×5	N+1	1200
100	9~23	7	35kW×6	N+1	1200
112	12~24	7	25kW×5	N+1	1200
140	13~23	7	35kW×6	N+1	1200