

FusionDC1000C Prefabricated Modular Datacenter

Introduction

FusionDC1000C is a new and prefabricated modular data center that adopts the modular design, LEGO assembly, pre-integrated and pre-tested in factories, to minimize onsite workload, supports fast deploy, online upgrade and capacity expansion. The solution is classified into five types based on functions: equipment module, MEP module (cooling), power module, hydraulic module and auxiliary module. The prefabricated modular data center is configured with the data center infrastructure management (DCIM) system. In addition, the AI technologies (iCooling, iPower, and iManager) are used to improve the TCO and cash flow of the customer throughout the data center life cycle, helping the customer achieve business success.

Application Scenarios

- Public cloud, large colocation data centers, and ultra-large Internet service data centers.
- Medium- and large-sized data centers of enterprises or governments.
- AI computing and HPC.

Features & Value

Simple

- Pre-integration and pre-test of devices in the factory, synchronous basic civil work and module factory production, reducing TTM by 50%^①.
- Modularized components, modularized functions, and PODs^②, on demand deployment, and phased capacity expansion.
- "one layer, one DC", vertical capacity expansion, and on-demand deployment.

Green

- Indirect evaporative cooling maximizes the use of natural cooling sources and reduces the PUE.
- Optional smart fanwall cooling technology and high-temperature chilled water, 50% improvement in cooling efficiency.
- Green building, no dust and noise on the construction site, and less construction waste.

Smart

- AI-based intelligent optimization continuously reduces data center energy consumption.
- Use smart sensors and big data analysis to precisely manage available resources and tenant information, maximizing the value of data center resources.

Reliable

- The prefabricated data center complies with the TIA 942 standard.
- Huawei iPower technology implements full-link monitoring of power supply and distribution and core components fault prediction to ensure uninterrupted operation.



Reference Layout 1



Reference Layout 2



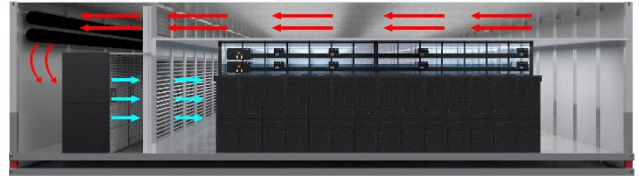
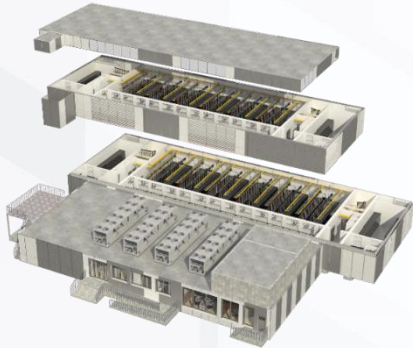
Reference Layout 3

^① China: 1000 cabinets, 20 months for traditional civil engineering, 9 months for prefabricated modular data centers; Middle East: 600 cabinets, 30 months for traditional civil construction, 15 months for prefabricated modular data centers

^② POD: point of delivery

Typical Reference Design

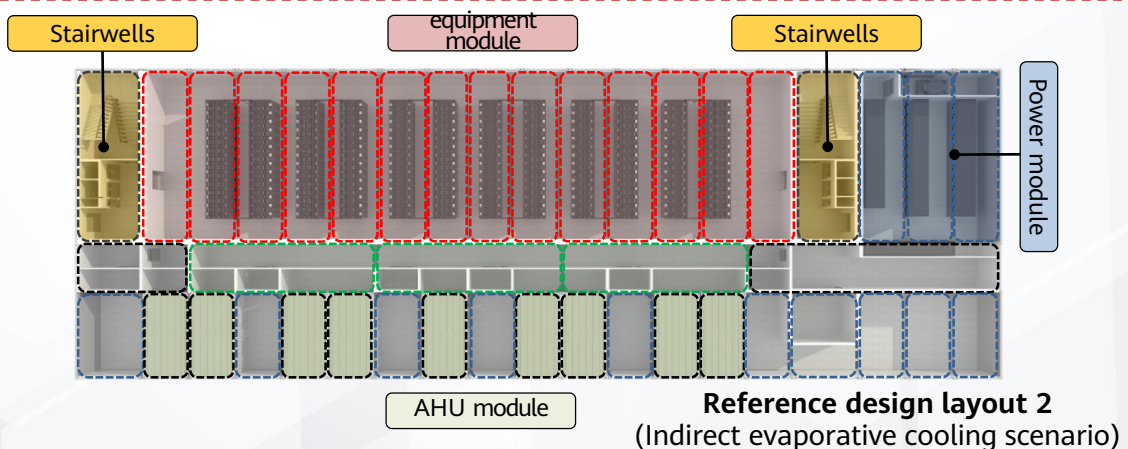
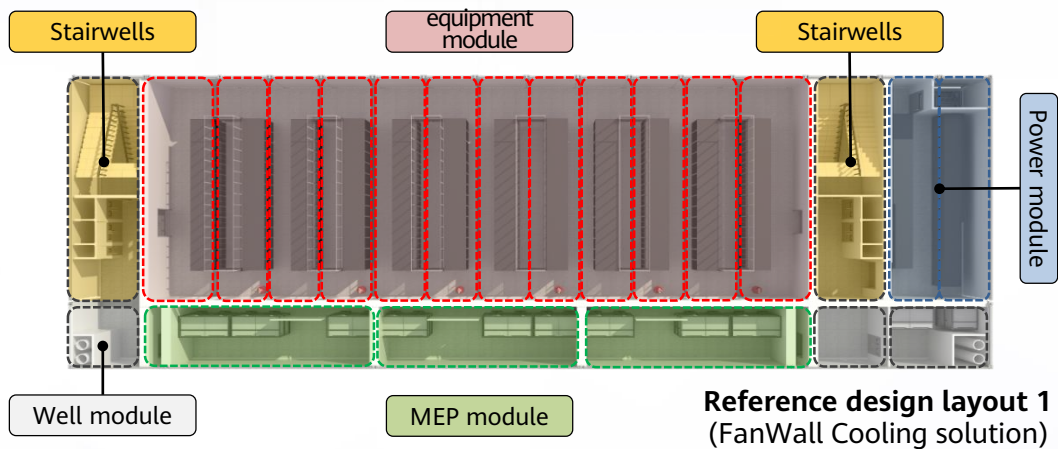
Based on customer requirements and the granularity of power distribution and cooling, we can match various combinations. The following uses the FusionDC1000C IT load of 4 MW as an example to describe the reference design.



Reference design for the Smart FanWall cooling scenario

- **Introduction:** 2 layers, 336 racks, maximum IT power load of 2016 kW per layer (including 6 IT micro-modules, 28 racks per micro-module, 336 kW load, and average of 12 kW/R)
- **Highlights:** The power supply and distribution devices and IT devices are deployed at the same layer, "one layer, one DC ". The Smart Busway is adopted to support upgrading the power of IT devices on the same floor between 6 kW/R to 12 kW/R, and support online expansion of the power capacity on new floor. Adopts Fanwall, no raised floor, and high space utilization in vertical.

Typical Reference Design Layout



Main parameters of the reference design(POD)

Category	Item	FanWall Cooling solution	Indirect evaporative cooling scenario
General	Altitude	Altitude≤4000m ^①	
	Environment adaptability	Class A/B/C environment: Class C environment is 500m~3700m away from strong corrosive environments (such as seaside, garbage pileup, and heavily polluted chemical plants) ^② .	Class A/B/C environment: Class B environment is at least 3,700m away from strong corrosive environments (such as seaside, garbage pileup, and heavily polluted chemical plants) ^② .
	Operating temperature	-5~+55° C, -40~+45° C(if the temperature is lower than -5° C, perform external wall insulation)	-40~+45° C(if the temperature is lower than -5° C, perform external wall insulation)
	Working humidity	5%RH~95%RH	
	Tier Level	TIER III, 2N	
	Stack Layers	≤5 layers	
	Prefab module life	25-year standard, 50-year customization for specific environments ^③	
	Total IT capacity	≤2016kW@336R/layer	≤1344kW@336R/layer
	Average power per cabinet	≤12kW(Up to 15 kW per cabinet)	≤8kW(Up to 15 kW per cabinet)
	Cabinet W x D x H	600mm × 1200mm × 2000mm/2200mm ^④	
load design	live load	Power supply area: 15 kN/m2; equipment area: 12 kN/m2; corridors and public areas: 5 kN/m2 ; ceilings: 2.4 kN/m2; rooftops: 0.75 kN/m2	
	Seismic load	Ss≤0.67 S1≤0.2; Soil typesD Design category≤D	
	Other payloads	Wind speed 32.7m/s	
	load combination	ASCE7-10, EN1990, GB 50009	
Electrical	Power System	380/400/415V 50/60Hz 3P+N+PE	
	UPS	2×1200kVA	2×1600kVA
Temperature control	Backup time	SmartLi 10 minutes@full load	
	Cooling redundancy	N+1, 10 minutes continuous cooling @ full load	
	Temperature and humidity range of the IT device area	18-27°C; 20%RH~80%RH	
Monitoring	heat transfer coefficient of envelope	Total heat transfer coefficient ≤ 0.3 W/(m ² ×K)	
	DCIM Configuration	iManager NetEco	
	Optional Features	Work order management, energy efficiency management, temperature map, mobile app O&M, asset capacity management, iCooling, and third-party southbound access	
	Northbound access	SNMP NBI, Webservice NBI, CTCC C NBI, and FTP NBI	
	Power and environment monitoring system	Yes, collected by the ECC	
	In-room access control system - security	Yes, three-in-one card reader, third-party security platform	
	Modular Access Control System - Operation	Yes, three-in-one card reader, managed by the ECC800	
	CCTV	Including room-level and module-level, and the default storage duration is 90 days.	
	Hydrogen detection	Optional	
	Water immersion system	Yes, addressable	
	Intelligent lighting	Optional	
	SMS alarm	Optional	
Fire protection	Fire extinguishing system	Including gas fire extinguishing in equipment areas, water spray in non-equipment areas, non-addressable (customized addressing type)	
	Fire resistance time of bearing beam and column	Standard: 120 minutes	
	Fire resistance time of the external protective structure	Standard: the external wall 90 minutes and the internal wall 60 minutes	
	Fire resistance time of the fire door	90 minutes	
Fire Extinguishing Agent and Detector	HFC227-ea, equipped with ASD		

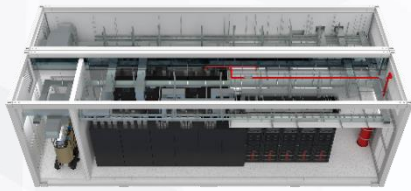
① The power supply and distribution capability derating is according to EN/IEC 62040-3 when the altitude exceeds 1000m. For details about the cooling parameters, see Huawei smart cooling product data sheet. The overall derating is the one with the larger derating coefficient.

② For the definition of class 2A/B/C environments refer to Huawei enterprise standards. The corresponding ISO9223/12944 environment classification is C1/C2/C3/C4.

③ According to ISO12944-2/ISO12944-1, the equivalent service life of a 1440-hour salt spray test in a C4-High environment is 25 years. 50 years in the C3 environment and 40 years in the C4/C5 environment (A third-party certification report can be provided.)

④ Cabinets are not defaulted, only showing the dimension limitation.

Introduction to Core Modules



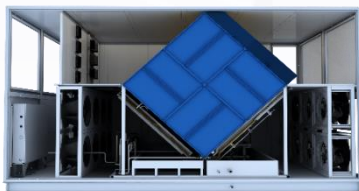
Power Module

- 380/400/415V 50/60Hz; 3P, four-wire+PE, UPS: 2*1,200 kW, input power factor 0.99
- SmartLi-512V-80Ah, Backup 10min@ full load
- Dimensions (mm): 12,192 (40ft) (L) * (2*2,438)(W)*4,150(H)
- Busway connection
- 10min@ full load under continuous refrigeration



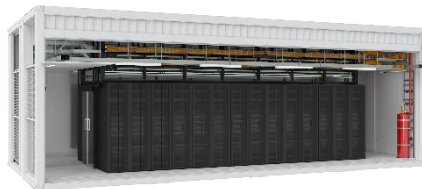
MEP Module
(intelligent Fan wall)

- 3* FusionCol8000-C210 (210kW/unit), total cooling capacity of 630 kW
- Dimensions(mm): 9,827 (L)*3,495 (W)*4,150 (H)
- Inlet/return water temperatures: 20° C/28° C
- Cold aisle temperature control: 24° C / 36° C
- 10min continuous cooling@full load



MEP Module
(indirect evaporative cooling)

- 1* FusionCol8000-E240 (240kW/unit), air volume: 55,000 m³/h; supplementary cooling capacity : 10%~55%
- Supply air temperature (° C)/Humidity (%): 25° C/50%
- Return air temperature (° C)/Humidity (%): 38° C/25%
- Dimensions: 6,058(L)*2,438(W)*4,150(H)
- Net weight/Gross weight: 11000kg/11500kg



Equipment Module

- 28 IT cabinets ① : 336 kW (a single cabinet supports a maximum of 15 kW)
- Dimensions (mm): 12,192 (40 ft)(L)*3495/2438 (W)*4,150(H)
- Support cabinet dimensions (mm): 600(W)*1,200(D)-2,000/2,200(H)
- With aisle containment
- 250A/400A busway, A/B dual power supply for each row
- 2 pcs 3P/32A rPDUs for each cabinet
- No raised floor, floor-mounted

① Only the device installation space is provided by default.