Large Prefabricated Modular Data Center FusionDC1000C

Product Overview

FusionDC1000C is a prefabricated modular data center that adopts the modular design, Lego block concept, and factory pre-integration test to minimize onsite workload and support fast deploy.
Pre-fab. modules are classified into five types based on functions: equipment module, MEP module (cooling), power module and hydropower module(Valves & Pumps).
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.

Reference Layout 1

Application Scenario

- 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

Reference Layout 2

Feature and Value

Simplified

- 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 PODs②, on-demand deployment, and phased capacity expansion
- Less onsite workload and simple project management

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 reduce power consumption by 3%.
- Green building, no dust and noise on the construction site, and less construction waste

Reference Layout 3

Intelligent

- 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

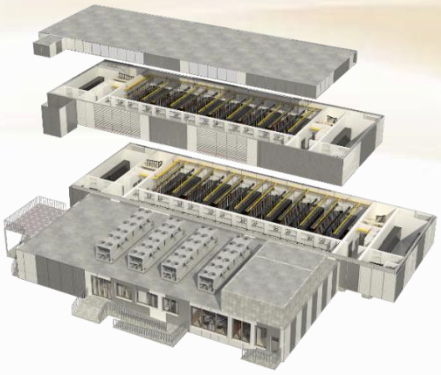
- The prefabricated data center complies with the TIA 942 standard.
- Huawei iPower technology implements full-link monitoring of power supply and distribution and core components fault prediction to ensure uninterrupted operation.

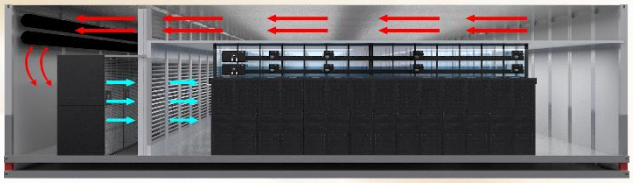
1. China: 1000 cabinets, 20 months for traditional civil engineering, 9 months for prefabricated modular data centers; Middle East: 600 cabinets, 30 months for traditional civil construction, 15 months for prefabricated modular data centers

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.

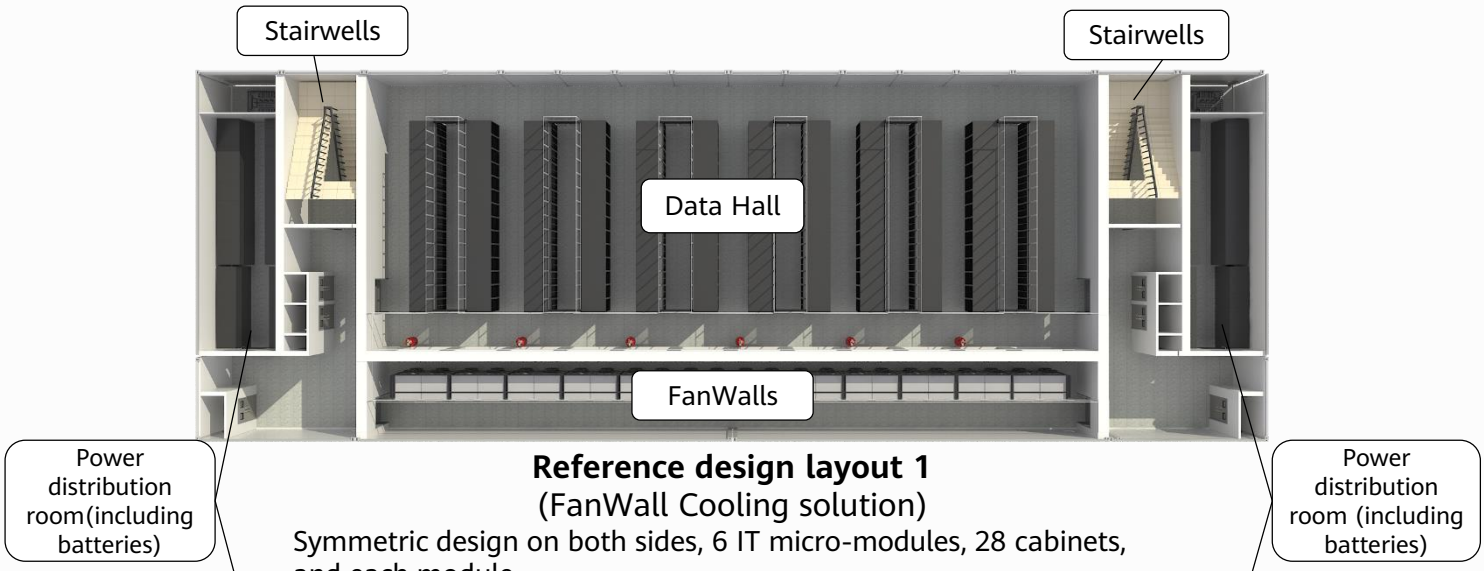




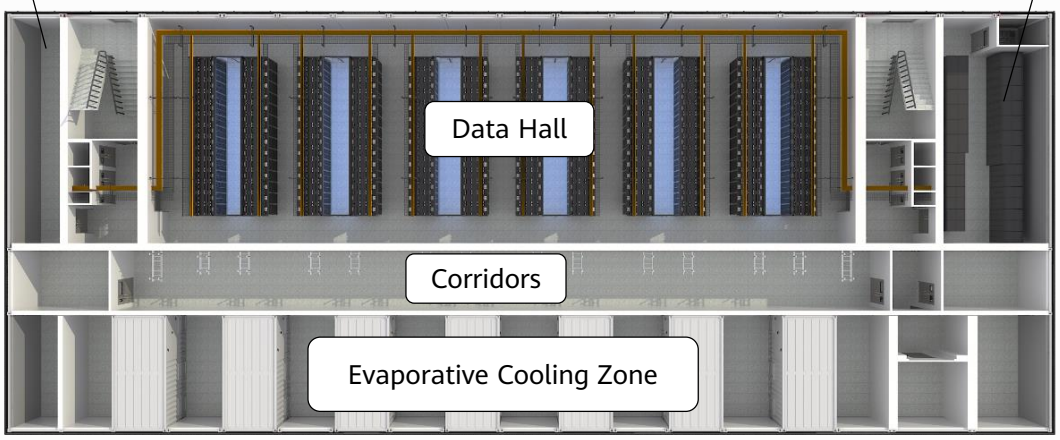
Reference design for the Smart FanWall cooling scenario

- Introduction: 2 layers, 336 racks, maximum IT power load of 1920 kW per layer (including 6 IT micro-modules, 28 racks per micro-module, 320 kW load, and maximum of 15 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 power density expansion. Adopts Fanwall, no raised floor, and high space utilization in vertical.

Typical Reference Design Layout



Reference design layout 1
(FanWall Cooling solution)
Symmetric design on both sides, 6 IT micro-modules, 28 cabinets, and each module



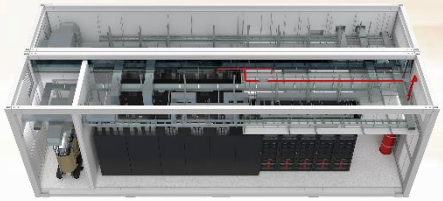
Reference design layout 2
(Indirect evaporative cooling scenario)

Main parameters of the reference design(POD)

Item		Overall specifications of the intelligent air wall cooling scenario
General parameters	Environment adaptability	• Altitude ≤ 4,000 m①; • Class A/B 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. • The operating temperature ranges from –20°C to +45°C. If the temperature is lower than –5°C, external wall insulation is required.
	Tier Level	Tier III
	Stack Layers	Two layers(reference design), stackable, up to five layers
	Prefab module life	25-year standard, 50-year customization for specific environments③
	Total capacity/Density of a single cabinet	≤ 5,040 kW/12 kW (maximum 15 kW/R)
	Total number and dimensions of IT cabinets (H x W x D)	336; 600*1200*2000/2200mm④
load design	live load	Power supply area: 15 kN/m2; equipment area: 12 kN/m2; corridors and public areas: 5 kN/m^2; ceilings: 2.4 kN/m2; rooftops: 0.75 kN/m2
	Other payloads	Wind load ≤ 1,000 mph
	load combination	ASCE7-10
Electrical specifications	Power System	380/400/415V 50/60Hz 3P+N+PE
	Backup time	2N, Lithium Battery 10 minutes@full load
Temperature control parameters	Cooling redundancy	N+1, 10 minutes continuous cooling @ full load
	Temperature range of the device area	20-28°C
	Humidity range of the equipment area	20%~80%
	heat transfer coefficient of envelope	Total heat transfer coefficient ≤ 0.3 W/(m*K)
fire protection coefficient	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	120 minutes
	Fire resistance time of the external protective structure	Standard: 90 minutes; customizable: 120 minutes
	Other fire resistance time	60 minutes fire resistance for internal partitions; Fireproof door fire resistance: 90 minutes
	Fire Extinguishing Agent and Detector	Heptafluropropane, equipped with suction smoke detectors
Monitoring parameters	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, third-party security platform
	Modular Access Control System - Operation	Yes, managed by the ECC800
	Cabinet-level access control system - operation	None. The ECC800 supports customization.
	In-room CCTV system - security	Yes. Facial recognition is available at entrances and exits. The default storage duration is 90 days.
	Module-level CCTV system-operation	Yes. The default storage duration is 90 days.
	Hydrogen detection	Yes, sir.
	Water immersion system	Yes, addressable
	Intelligent lighting	Optional

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

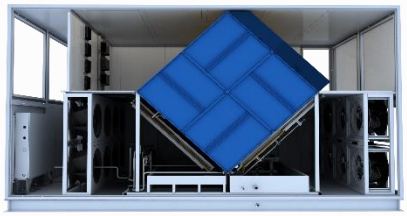


Power Module

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

MEP Module
(intelligent wind wall)

- 4* CRAH210Hs (210 kW), total cooling capacity of 840 kW
- Dimensions(mm): 9,827 (L)*3,495 (W)*4,150 (H)
- Inlet/return water temperatures: 20°C/28°C;
- Cold aisle temperature control: 18°C to 27°C
- 10min continuous cooling@full load



MEP Module
(indirect evaporative cooling)

- Cooling capacity: 220 kW; air volume: 55,000 m^3/h; maximum non-cooling capacity: 110 kW
- Supply air temperature (°C)/Humidity (%): 25°C/50%
- Return air temperature (°C)/Humidity (%): 38°C/25%
- Dimensions (mm): 6,058(L)*2,438(20ft)(W)*3,600(H)
- Net weight/Gross weight (excluding air channels): 5,150kg/5,700 kg

IT Equipment Module

- 28 IT cabinets: 1,320 kW (a single cabinet supports a maximum of 15 kW)
- Dimensions (mm): 12,192 (40 ft)(L)*4,901(W)*4,150(H)
- Support cabinet dimensions (mm): 600(W)*1,200(D)-2,000/2,200(H)①
- With aisle containment
- 400A busway, A/B dual power supply for each row
- 2 pcs 3P/32A rPDUs for each cabinet
- No raised floor, floor-mounted

1. Support only provide white space.

FusionDC is combination of Huawei latest solution and technology. It helps customer to build more efficiency, more reliable and future proof data center. All above showing is only the concept and some reference solution. More information please contact Huawei region interface.

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