



Vertiv™ 360AI

Solution design specifications

Solution code: ISV204-36A-B0AUM-N00



Vertiv.com

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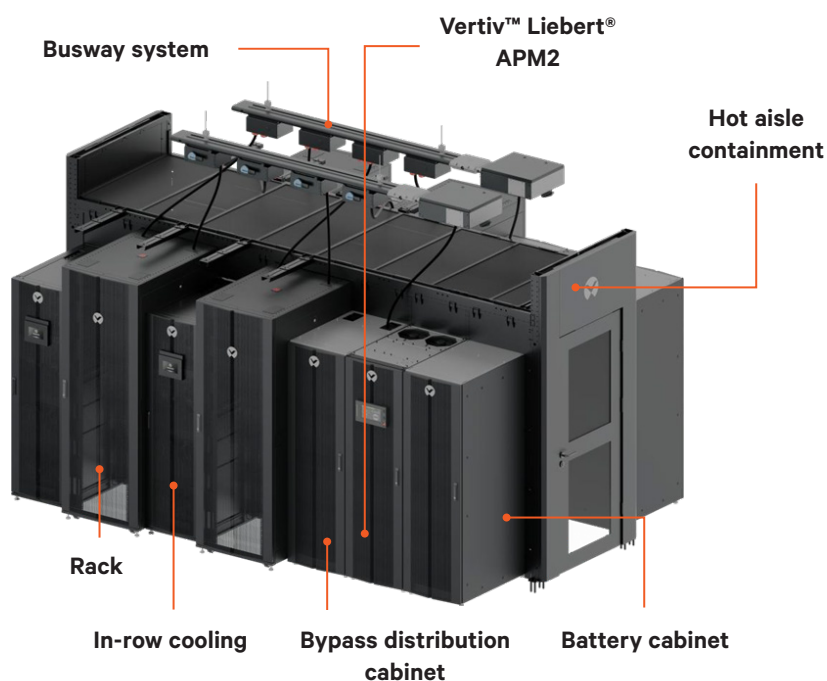
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Executive summary

Deploying artificial intelligence (AI) and high-performance computing (HPC) workloads can involve complex planning, high costs, and extended deployment timelines. The edge AI cluster solution from Vertiv helps simplify deployment with a validated four-rack design integrating air-cooled retrofit, modular power, and intelligent monitoring, supporting up to 120kW of IT load. Based on Vertiv™ Aisle Containment architecture, the solution is designed for real-time control and autonomous systems, computer vision inferencing, and mixed HPC workloads. It balances efficiency, scalability, and reliability while helping reduce disruption to existing facilities.

The hot aisle containment system from Vertiv isolates hot exhaust air from server racks within enclosed aisles, helping prevent mixing with cold supply air and improve cooling performance. This approach supports higher-density deployments, maximizes energy efficiency, and enables demanding AI and HPC workloads while minimizing facility modifications and operational costs.

By following this reference design, operators can accelerate deployment timelines, reduce design complexity, and gain greater confidence that their data center infrastructure can support mission-critical AI and HPC workloads today and as requirements evolve.



Design architecture

IT capacity

120kW

Total racks and average density

4 racks at 30kW/rack

Room voltage & frequency

415V, 60Hz

(Adjustable to room power available)

Floor load rating

300lbs/sqft

Primary use cases

Enterprise AI inference & real-time analytics.

Generative AI model fine-tuning.

Edge AI & computer vision.

Research & academic computing.

Healthcare & life sciences.

Design rationale

Air-cooled architecture for edge AI cluster.

On the enterprise premise (e.g. on the factory floor).

Highly scalable and adaptable for future capacity growth.

Retrofit of existing IT rooms with limited space.

Rapid deployment.

Plug-and-play data center expansion.

04 Rack(s)

120kW Total solution capacity

30kW Load per rack

Material list

Qty.	SKU	Description
4	CRD40	Row cooling: VertivCoolPhase in-row cooling unit
2	APM2-120	UPS for IT: Vertiv™ Liebert® APM2 415V 4W 120kVA N+1, with lithium battery cabinet
2	APM2X125JAAMCA	External maintenance bypass and power distribution cabinet
2	Powerbar iMPB	Vertiv™ PowerBar iMPB System: 250 A Busway, tap-off units, and endcap
8	VP4U60A2	Rack PDU: Vertiv™ PowerIT, Monitored Unit Level, 60/63A, 200-240/346-415V WYE, 43.4kW, Vertical, (36) Combination C13/C19
4	VR3357	Rack: Vertiv™ VR3357 48U 800 mm x 1200 m
1	RDU501	Rack manager: Vertiv™ RDU501 Intelligent infrastructure management appliance, 1U

Material list only includes major components, other supporting peripheral components such as the hoses, valves, cable, adapter kits, etc. would be part of final quote document.

Power management

The facility power system delivers conditioned power to the busway power distribution and its integrated components. This design uses a dual-path architecture with regulated power delivery.

A true 2N UPS power distribution architecture feeds the racks through dedicated row power distribution, supporting the IT load with stable and consistent power delivery.

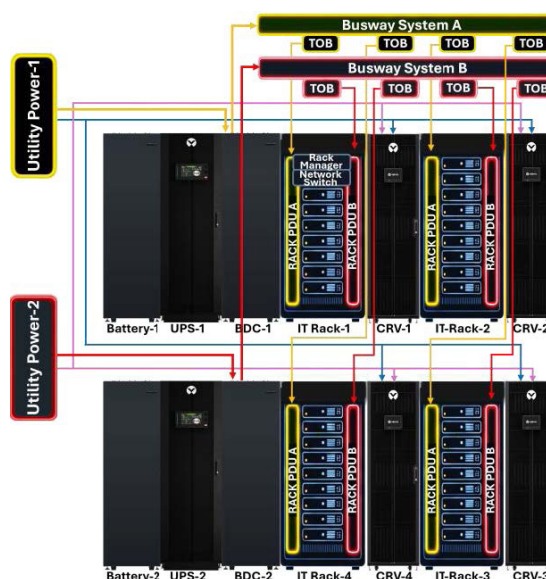
All components comply with applicable ANSI, UL, and IEEE standards. Detailed schematics and engineering documentation are available in the full design package.

Vertiv™ PowerBar iMPB provides scalable overhead power distribution with hot-swappable protection, enabling data centers of varying sizes to adapt more efficiently to changing power requirements.

Design parameter

This referencedesign may be adapted in the following ways without materially affecting performance:

- Modify power and cooling redundancy configurations.
- Adjust UPS configurations, including battery type and runtime (if applicable).
- Optimize cooling parameters to meet specific server requirements.



Power distribution architecture

Facility power attributes

Parameters	Value	Unit
Input voltage (main bus) for IT & thermal	415	V
Power path	Dual	-
Power redundancy for IT	2N	-
UPS capacity for IT	120	kW
UPS redundancy for IT	2N	-
UPS output voltage for IT	415	V
8 x rPDU (43.4 kW each) for capacity	347.2	kW



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IT whitespace

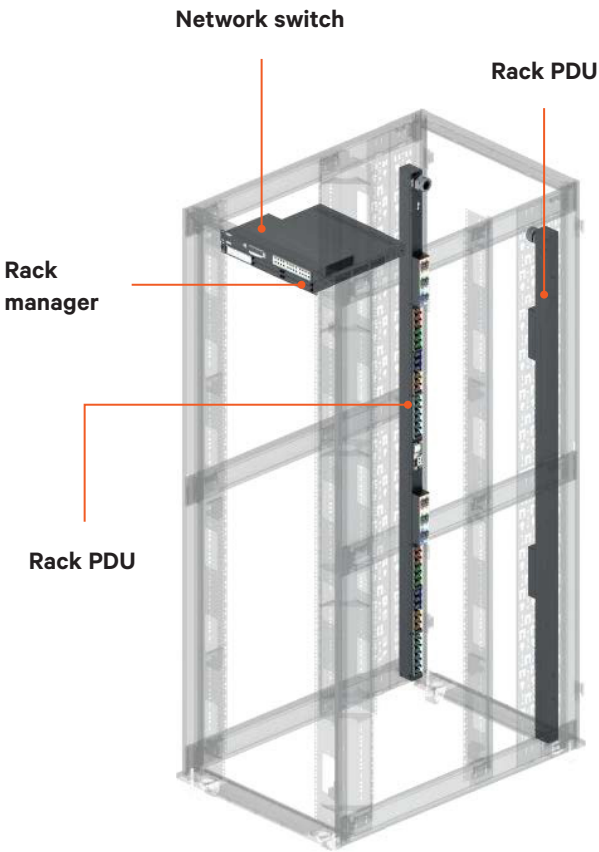
This four-rack design has an IT capacity of 30 kW per rack, making it ideal for deployments requiring a compact footprint. Instead of adding multiple pods, the solution supports higher density within a single pod, optimizing efficiency and helping reduce upfront capital expenditure (CapEx).

The IT space design specifies the physical infrastructure components and layout to meet performance objectives. Power distribution is managed through Vertiv™ PowerIT rack PDUs, providing unit-level monitoring and remote management. Environmental and operational data is consolidated through the Vertiv™ RDU501 for real-time visibility and control.

Design options

This reference design can be modified as follows without significantly impacting performance attributes:

- Add environmental and security monitoring.
- Change rack options (height, width, depth).
- Change power distribution options (Rack PDU type: basic or switched).
- Integrated advanced data center management.



Vertiv™ VR rack view

IT room attributes

Parameters	Value	Unit/Qty
IT load	120	kW
Input voltage	415	V
Supply voltage to IT	240	V
Number of racks	4	Rack
Rack size	48	U
Rack manager	✓	1
Rack PDU	✓	8



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Thermal management

Vertiv™ CoolPhase Row is a high-efficiency, row-based cooling solution designed to meet the demanding thermal management needs of modern high-density data centers.

Engineered for high-density environments, Vertiv CoolPhase Row is seamlessly integrated within the row of data center racks to optimize space utilization. It offers advanced temperature control 24/7/365, using inverter-driven compressors and variable speed fans. Together, they adjust cooling output to match dynamic heat loads, boosting energy efficiency and reducing operational costs. The latest design incorporates a refreshed look and standardized models, ensuring compatibility with global data center standards.

Key benefits

- Save energy with a capacity modulation of 20-100% to match real-time load.
- Maximize uptime with dual power supply and automatic transfe.
- Set and view system status with intelligent Vertiv™ controls and remote monitoring.
- Teamwork connection between multiple units for active standby lead or lag control.
- Rapid deployment pre-stocked in region for shipment.
- Helps reduce life cycle carbon emissions.

Main features

- Wider installation base with pipe run up to 390 ft.
- Higher cooling capacity (up to 40 kW).
- Wide range of working environments supported with outdoor heat rejection capability from -31°F to 126°F.
- Low-GWP refrigerant (R-32).

Vertiv™ CoolPhase
Row CRD40



Rack cooling attributes

Parameters	Value	Unit
Total net cooling capacity (N)	120	kW
Thermal redundancy	N+1	-
Cooling capacity of single unit	40	kW
Max airflow	5700	CFM
Number of fans	8	-
Standard fan motor	4.02	hp
Humidification capacity	6.61	lb/h
Condensate pump capacity at 6m head	10	l/min
Refrigerant	R-32	-



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Vertiv™ Aisle Containment

The Vertiv™ Aisle Containment system is a rack-independent solution designed to help maximize efficiency and capacity from the core to the edge in raised-floor and slab data centers. The system supports containment deployment before rack installation, helping simplify installation and accelerate deployment of data center equipment.

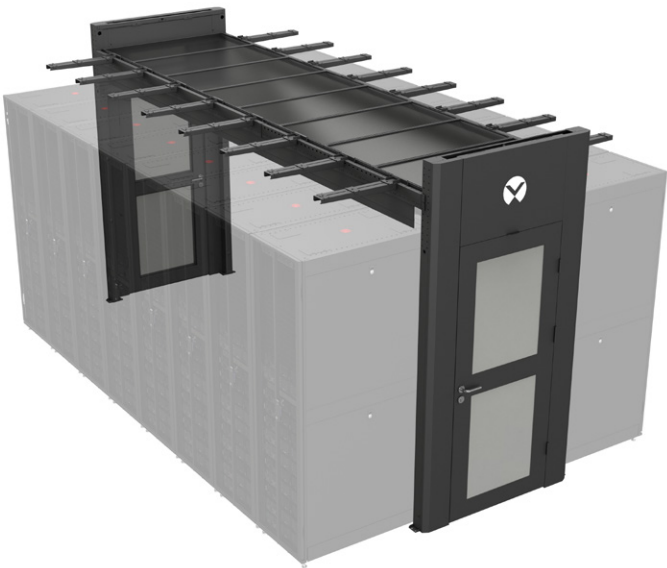
With ceiling heights adjustable to 52U and a full range of blanking panels and height adapters, the Vertiv Aisle Containment system can support standard-size racks and auxiliary equipment, including in-row UPS and cooling systems.

Key benefits

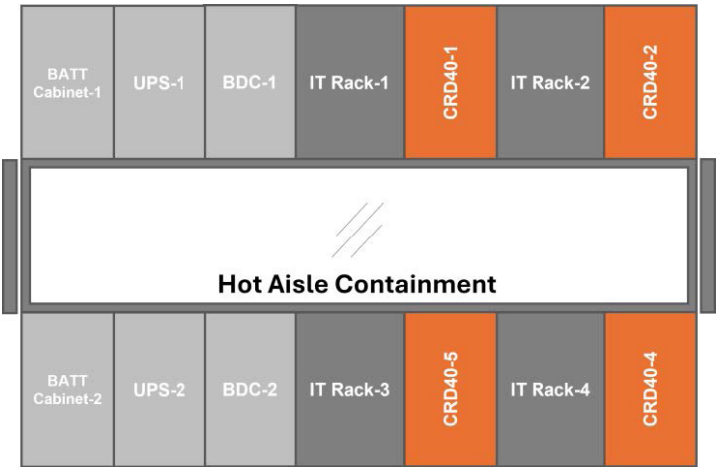
- Optimize cooling system efficiency.
- Maximize space efficiency.
- Prevents hot and cold air mixing.

Main features

- Flexible aisle widths 3ft (900mm), 4ft (1200 mm), 6ft (1800mm).
- Adjustable posts to support rack heights up to 52U.
- Translucent, thermal drop out or ducted roof options.
- Telescoping 10-16 ft (3048-4087 mm) aisle-length beams.
- Support for above-rack cable management.
- Full complement of blanking panels & height adapters.



Vertiv™ Aisle Containment



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Rack infrastructure management

Good design and quality construction alone may not be enough to support a highly available and efficient data center. Continuous monitoring and control help maintain design intent and operational performance.

Vertiv™ RDU501 provides intelligent infrastructure management for environmental monitoring and out-of-band access to critical systems such as UPS units, cooling systems, and IT service processors. The platform collects and manages operational data throughout the facility lifecycle, supporting performance, energy, and reliability goals.

Control level: Operators can monitor and manage thermal and power conditions in real time to support business continuity and track energy consumption in secure environments.

Operations level: Managers can optimize operations and asset utilization using advanced analytics across multiple sites.

Enterprise level: Executives can align efficiency and operational priorities with broader business objectives through actionable infrastructure insights.



User interface of the Vertiv™ RDU501

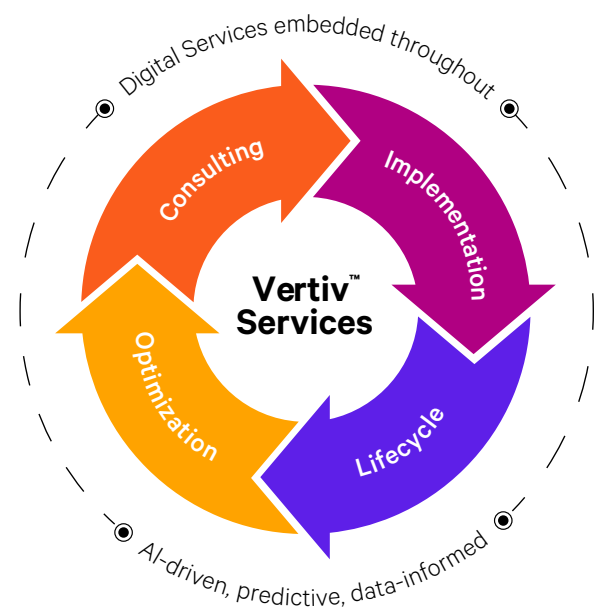
Key features and benefits

- Easy commissioning and fast deployment.
- Unified dashboards for thermal conditions, power infrastructure, and asset monitoring.
- Thermal, power, and security alarms with reporting capabilities.



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Vertiv™ Services



- 1 Comprehensive portfolio of services to address technical and business challenges, simplify operations, and reduce costs.
- 2 Global team of trained specialists supporting every phase of data center deployment and operation.
- 3 Standardized, documented, and validated processes leveraging automation tools and proven methodologies.

Get more information for this design

Every Vertiv™ reference design is delivered with complete technical documentation for engineers and project managers. This includes CAD and PDF schematics, optimized floor layouts, CFD thermal performance analysis, and equipment lists detailing the cooling units, power systems, and management devices included in the design. Additionally, 3D illustrations and wireframe views provide realistic visualizations of the solution for planning and deployment. Documentation is offered in multiple formats to meet the requirements of both technical teams and project stakeholders working on data center projects.

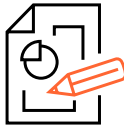
Visit [this link](#) to get the complete technical package.



Electrical diagram



Monitoring



Illustrations



Bill of materials



CFD analysis

