



Vertiv™ 360AI

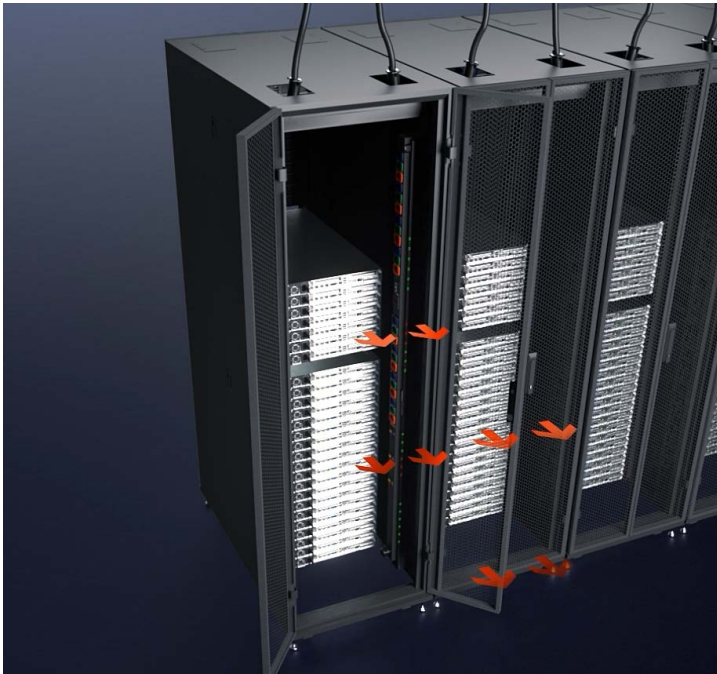
Solution brief



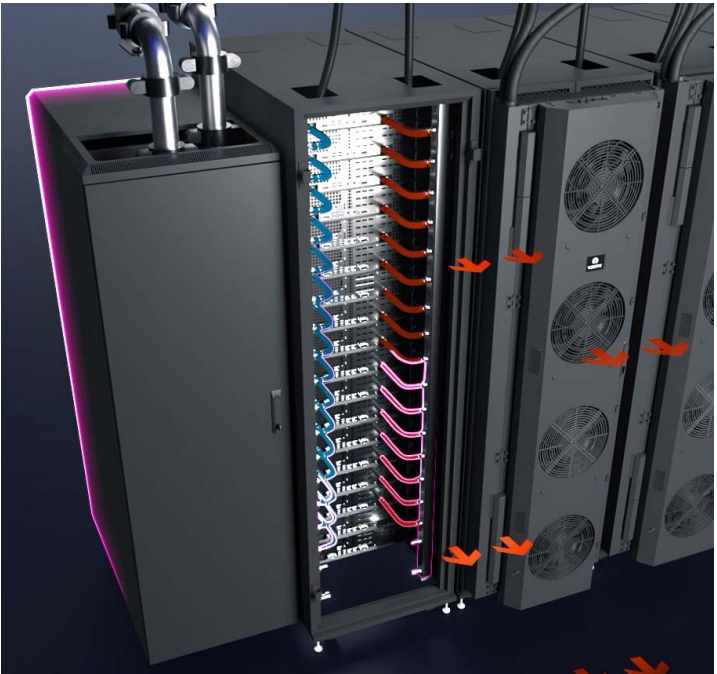
[Vertiv.com](https://www.vertiv.com)

The AI heat wave is coming

Existing power and cooling infrastructure will require significant upscaling to support the unprecedented demand of accelerated computing. AI inferencing and model training can drive power and cooling loads to unprecedented rack densities.



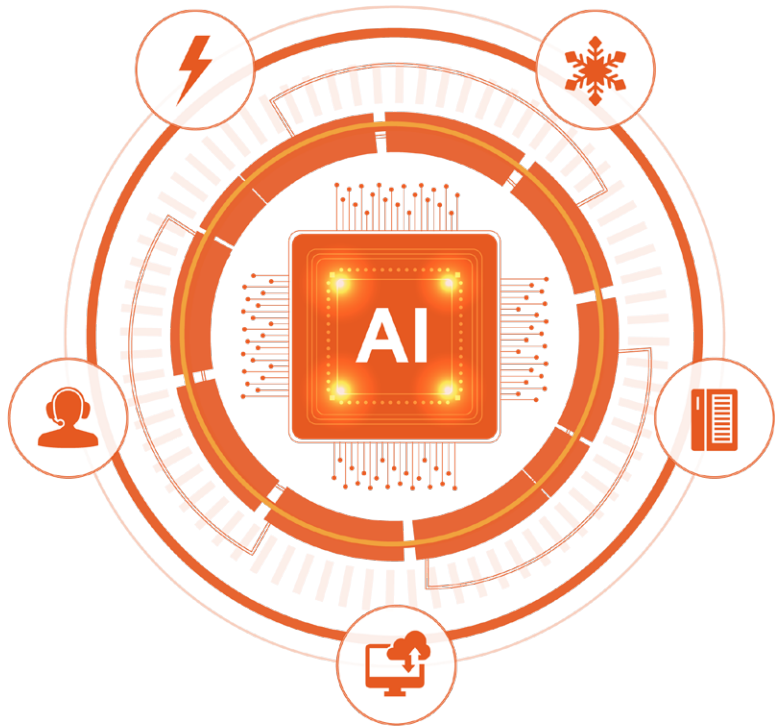
Standard CPU
Hot air from server fans



AI GPU Server (Liquid Cooled)
Rack Manifolds | Row Coolant Distribution Unit

The easy way to power and cool AI

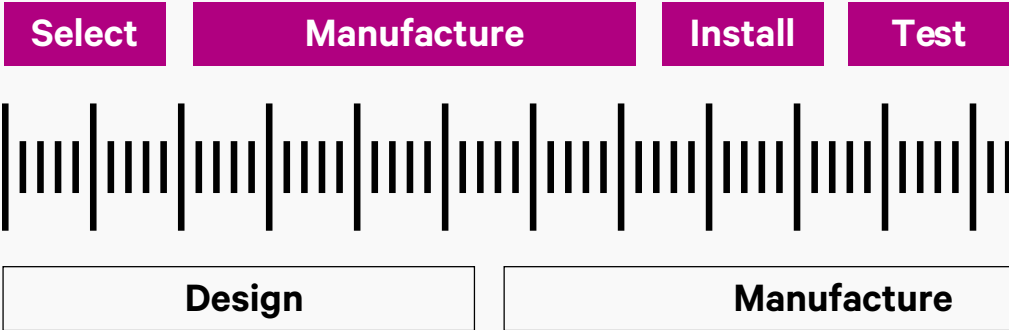
Vertiv™ 360AI provides a complete solution to power and cool high-performance computing, accelerate deployment, and keep AI applications running at peak performance. Vertiv™ 360AI includes the complete portfolio of power, cooling and service solutions that solve the complex challenges arising from the AI revolution. Within the Vertiv 360 AI solutions portfolio, Vertiv's pre-engineered AI solutions offer an easier and faster option for our customers to deploy AI infrastructure.



- Power
- Cooling
- Enclosures & Structures
- Digitized Management
- Lifecycle Services

Accelerate your ROI on AI

Don't let infrastructure slow down your return on AI investments, streamline design, deployment, operations, and lifecycle management.

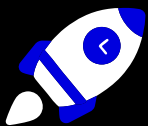


Vertiv pre-engineered AI solutions Up to 2x faster



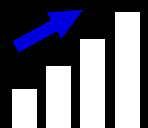
Traditional design & build

Top benefits of Vertiv AI pre-engineered solutions



Reduce deployment time up to 50%

Pre-engineered solutions can eliminate design work reducing deployment time up to 50%.¹



10x Capacity in the same footprint

Increase power and cooling capacity up to 10x in the same footprint to help prevent stranded capacity.



Broad range, scalable

Solutions can scale from Edge inferencing, to AI test labs, to large AI deployments at scale. Systems range from 70kW racks, to a 1.4MW row.



Flexibility & customization

Solutions can scale from Edge inferencing, to AI test labs, to large AI deployments at scale. Many heat rejection and form factor options allow for retrofit and reuse of existing cooling systems, minimizing deployment cost and scope.



Proven technology

Built with the most complete portfolio of power and cooling infrastructure in the industry. Only Vertiv can meet both the power and cooling demand of high-performance computing (HPC).

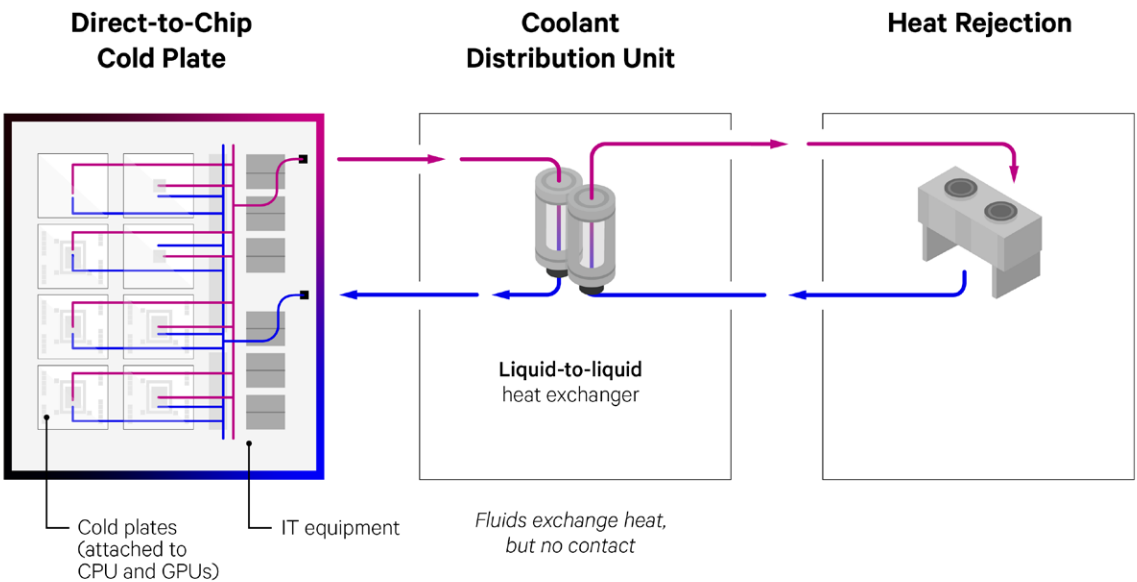
¹ Vertiv management estimate based on direct market research on pre-engineered solutions, actual results will vary.

Flexible cooling strategies

Direct-to-chip liquid cooling uses cold plates to remove majority of heat, but leaves some residual heat that requires supplemental cooling to remove. Vertiv pre-engineered AI solutions enables the combination of air and liquid cooling topologies with different heat rejection methods to provide flexibility and minimize deployment costs.

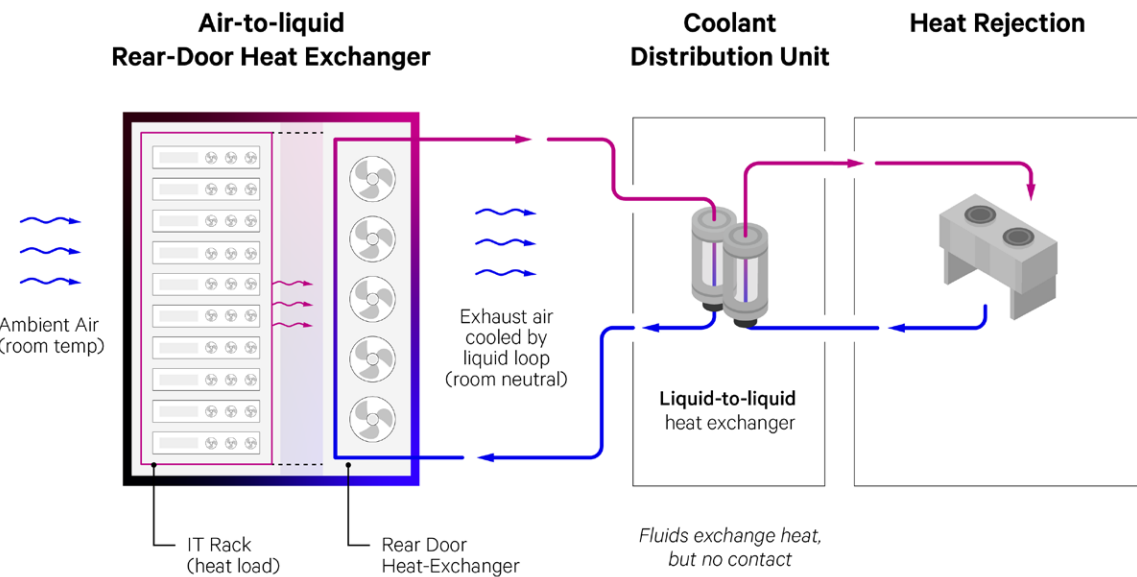
Direct-to-Chip liquid cooling

Liquid to Air (L2A), Liquid to Liquid (L2L), Liquid to Refrigerant (L2R)



Rear-Door heat exchangers

Air to Liquid (A2L)



Kickstart AI deployments with pre-engineered solutions

Pre-Engineered solutions can scale from Edge Inferencing to training and AI at scale.



Technology summary	Solution model number	Racks	Density per rack	Green field/ Brown field	Heat removal	Chiller included	
				From server	From room		
 AI test environments, training pilots or edge inferencing							
Small HPC minimal retrofit	1L70R	1	70 kW	Brown field		 Air	–
Small HPC retrofit for chilled water system	1L100R	1	100 kW	Brown field		 Water / glycol	–
 AI labs, transition to AI data center							
Mid-size HPC cost-optimized retrofit	4L400R	4	100 kW	Brown field		 Refrigerant	✓
Mid-size HPC with increased heat capture	4XL400	4	100 kW	Brown field / Green field	 + 	 Water / glycol	–
Mid-size HPC retrofit for air cooled computer rooms	4L160R	4	40 kW	Brown field / Green field		 Refrigerant	✓
Mid-size HPC low complexity retrofit with air-cooling	5L500	5	100 kW	Brown field		 Water / glycol	–
 Prototype AI factory							
Large HPC preserving room neutrality	12XL1200	12	100 kW	Brown field / Green field	 + 	 Water / glycol	–
Large HPC building towards scale	14L1400	14	100 kW	Brown field / Green field		 Water / glycol	–

Note: Full cooling capacity may require supplemental cooling capacity from air or other system, as direct-to-chip liquid cooling technology uses cold plates that do not remove 100% of heat from servers.

Complete solutions with superior range of technologies for high-density

Coolant distribution units (CDUs) & manifolds



- **Precise Temperature Control** to eliminate thermal shock for server CPU and GPUs.
- **Redundant Pumps and Dual Power Feeds** for optimizing reliable operation.
- **Teaming Capabilities** allow for fleet control to optimize efficiency and reliability.
- **Innovative Stainless-Steel Design and Hygienic Couplings** help ensure Secondary Fluid Network integrity.
- **Row Manifolds** overhead manifolds included, no raised floor required. (Underfloor available upon request).
- **Rack Manifolds** compatible with quick disconnects.

Environmental monitoring



- **Environmental Sensors** – monitor rack enclosures for temperature, humidity, and dewpoint.
- **Leak Detection** – Up to 100 feet of moisture sensing cable to detect any moisture.

Heavy-Duty rack enclosures



- **High-Capacity** for high-density applications, up to 4,250 lbs Static Load.
- Designed to enable **full integration & shipping of high-density IT systems**, up to 3,550lbs.
- **Globally Available** in 12 standard sizes.

Overhead power distribution



- **Hot-swap without any special tools** with built-in safety and plug-and-play features allowing.
- **Reduces CAPEX** – no need for raised floors to distribute power.
- **Smart metering** to monitor efficiency and capacity.

Rack power distribution

Rack PDUs up to 80A for high-density applications



- Capacity up to 80A for high-density applications.
- **Engineered-to-order models available**, with higher capacities available when required.
- **Compact design** – fit up to 4 in a single rack.
- **Outlet monitoring and switching** to track and control workloads remotely with software suite.
- **Connect up to 16 environmental sensors** to monitor temperature, humidity, dew point, and water leaks.

Sizing up the right solution for your IT



	Single rack		Mid-Size row			Large row		
Vertiv solution ID number	1L70R	1L100R	4L400R	4XL400	4X160R	5L500	12XL1200	14L1400
Rack quantity	1	1	4	4	4	5	12	14
Rack density	70	100	100	100	40	100	100	100
Rear-Door heat exchanger included				X	X		X	
Total system capacity ¹	70	100	400	400	160	500	1200	1400

Compute architectures

Server make and model	Main cooling technology	Total quantity of compute nodes supported (evenly distributed across rack enclosures)							
Dell XE9640	Liquid direct-to-chip	16	22	92	92	-	115	276	322
Dell XE9680	Air-cooled	-	-	-	-	12	-	-	-
NVIDIA DGX H100	Air-cooled	-	-	-	-	16	-	-	-
NVIDIA GH200 NVL32	Liquid direct-to-chip	1	1	4	4	-	5	12	14
NVIDIA GB200 NVL72	Liquid direct-to-chip	-	-	3	3	-	3	9	10
Supermicro SYS-421GU-TNXR	Liquid direct-to-chip	10 (12 Max) ²	10 (12 Max) ²	40 (48 Max) ²	40 (48 Max) ²	-	50 (60 Max) ²	120 (144 Max) ²	140 (168 Max) ²

Notes:
¹ Direct-to-chip liquid cooling uses cold plates in the server and will leave residual heat that needs cooled through supplemental cooling technologies, such as rear-door heat exchangers or perimeter air-cooling systems.
² Number in parenthesis refers to a fully populated cabinet without space for other devices, such as switches or network devices.

Key considerations

What is the scale of deployment?

- How many nodes, or how many racks are needed?
- Is this a proof-of-concept for testing?
- Is this AI at scale in a data center?

What rack density is needed?

- What is the design rating of each node?
- Do you want to design for future expansion?

Retrofit vs. new build?

- Can existing cooling systems be modified?
- How much floorspace is available?

Find the right cooling topology

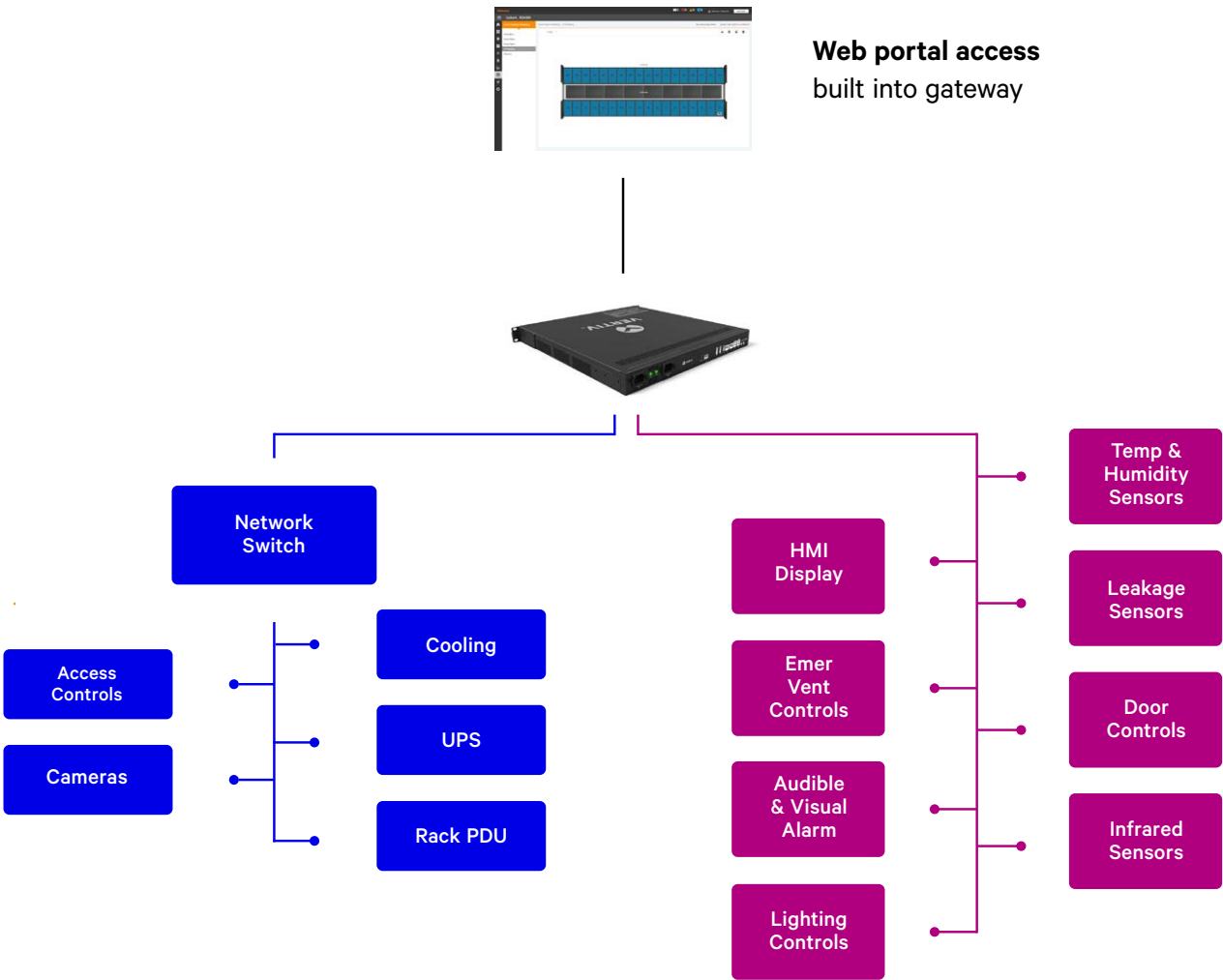
- Liquid-cooled or air-cooled servers?
- Are there existing chillers on site?
- Is there existing air cooling to supplement liquid?
- Can hot air be rejected into the space, or does heat need to be captured for reuse?

Centralized, scalable remote management architecture

Integrated monitoring & remote management

Infrastructure management gateway appliance

- RS485 Serial Communication
- TCP/IP Network Communication



End-to-end lifecycle services included



Deployment

- Site assessment.
- Design.
- Project management.



Commissioning

- Installation.
- Startup.
- Testing.



Maintenance

- Preventative maintenance.
- Fluid management.
- Troubleshooting.

Services that can cover the entire lifecycle, anywhere

50+ years building and servicing the world's most critical infrastructure, with end-to-end capabilities for high-density environments.



255+
Service Centers



3,135+
Field Engineers



415+
Tech Response

US and Canada



Service Centers

80+



Field Engineers

965+



Tech Response

145+

Caribbean and Latin American



Service Centers

15+



Field Engineers

535+



Tech Response

100+

Europe, Middle East, and Africa



Service Centers

60+



Field Engineers

685+



Tech Response

90+

Asia Pacific



Service Centers

95+



Field Engineers

945+



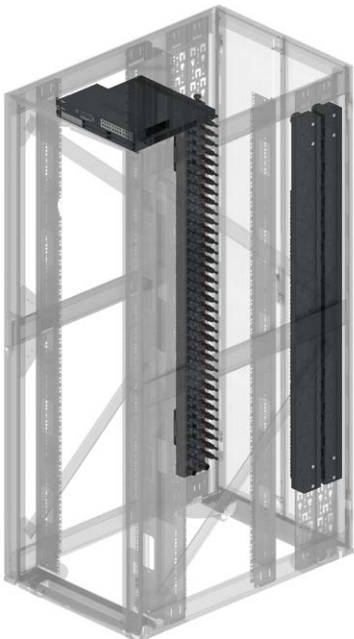
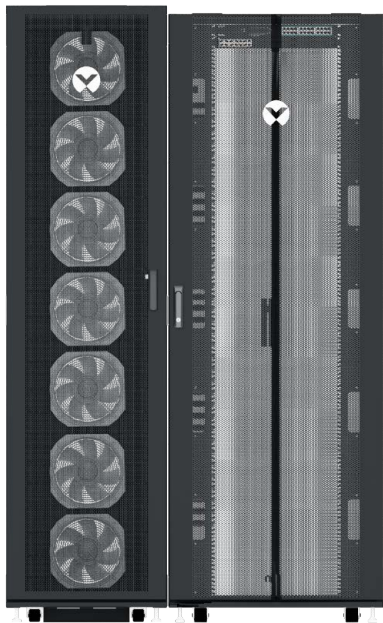
Tech Response

75+

Liquid to air direct-to-chip retrofit

For facilities that are unable to change existing architectures and do not have chilled water available on site, this solution offers a path to introduce liquid cooling into the existing space.

Model Number: 1L70R



Rack Interior View

System capacity

1 Rack(s)	70 kW Total solution capacity	70 kW Load per rack
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Technologies used

Cooling Method	Direct-to-chip (liquid)
Heat Rejection Type	Air
Key components	
Rack Enclosure	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	63A Monitored rPDU (VP7N6013)
Coolant Distribution Unit (CDU)	Vertiv™ Liebert® XDU070

Dimensions (L, D, H): 4.59ft x 3.94ft x 7.22ft

What's included

- 1

Rack Enclosure
- 2

Rack PDU
- 3

Coolant Distribution Unit
- 4

Rack manifold
- 5

TH Sensors – 2 per rack
- 6

Remote Management
- 7

Deployment + Commissioning
- 8

Maintenance

1L70R

Contact Vertiv for Availability

Liquid to liquid direct-to-chip in-rack retrofit

For facilities considering a small footprint deployment yet implement full liquid-to-liquid solution. Solution does not require additional floor space for coolant distribution units, while leveraging existing air-cooling for remaining portion of the heat load.

Model Number: 1L100R

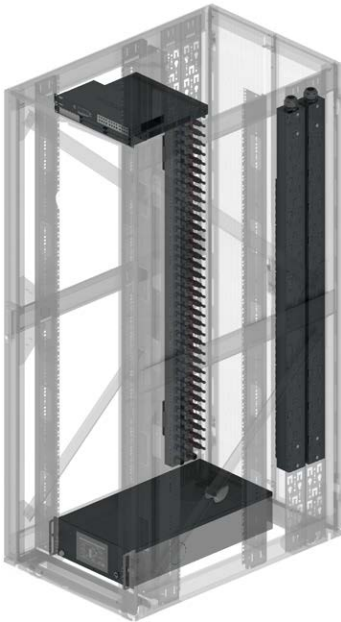
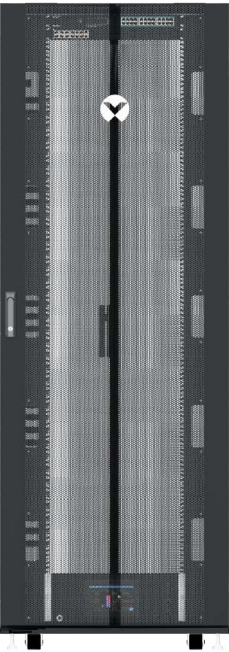
System capacity

1 Rack(s)	100 kW Total solution capacity	100 kW Load per rack
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Technologies used

Cooling Method	Direct-to-chip (liquid)
Heat Rejection Type	Water/Glycol
Key components	
Rack Enclosure	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
In-Rack CDU	Vertiv™ Liebert® XDU100

Dimensions (L, D, H): 17.02ft x 3.94ft x 7.22ft



Rack Interior View

What's included

- 1

Rack Enclosure
- 2

Rack PDUs
- 3

In-Rack CDU
- 4

Rack manifold
- 5

TH Sensors – 2 per rack
- 6

Remote Management
- 7

Deployment + Commissioning
- 8

Maintenance

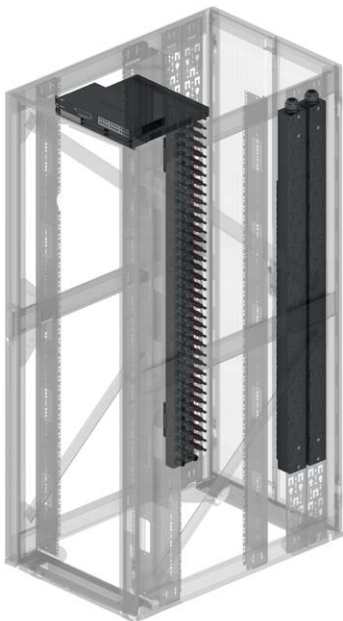
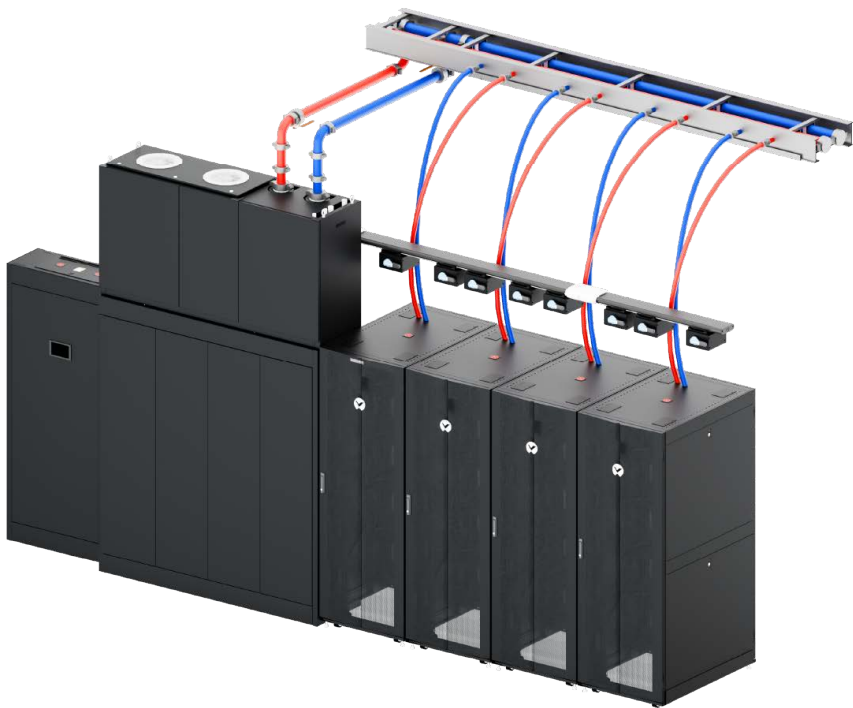
1L100R

Contact Vertiv for Availability

Liquid to liquid direct-to-chip retrofit-optimized row

Intended for retrofit of a data center with existing infrastructure and Vertiv cooling systems, can leverage existing Vertiv™ Liebert® DSE cooling system piping and heat rejection.

Model Number: 4L400R



Rack Interior View

System capacity

4

Rack(s)

400 kW

Total solution capacity

100 kW

Load per rack

Technologies used

Cooling Method	Direct-to-chip (liquid)
Heat Rejection Type	Refrigerant
Key components	
Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
Indoor Split Chiller	Vertiv™ CoolChip Econophase CDU
Busway	250A IMPB Busway, taps, and endcap

Dimensions (L, D, H): 17.02ft x 3.94ft x 7.22ft

What's included

- 1

Rack Enclosures
- 2

Rack PDUs
- 3

CDU
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rack manifold
- 7

TH Sensors – 2 per rack
- 8

Remote Management
- 9

Deployment + Commissioning
- 10

Maintenance

4L400R

Contact Vertiv for Availability

Liquid to liquid direct-to-chip with heat reuse

Intended to replace and optimize existing footprint while maintaining room neutrality. Combines the use of direct-to-chip liquid cooling with a rear door heat exchanger.



Rack Interior View

Model Number: 4XL400

System capacity

4

Rack(s)

400 kW

Total solution capacity

100 kW

Load per rack

Technologies used

Cooling Method	Direct-to-Chip + Rear-Door Heat Exchanger
Heat Rejection Type	Water/Glycol

Key components

Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
CDU	2x Vertiv™ Liebert® XDU450
Busway	600A iMPB Busway, taps, and endcap
Rear-Door Heat Exchanger	4x 48U, DCD35

Dimensions (L, D, H): 14.42ft x 4.92ft x 7.22ft

What's included

- 1

Rack Enclosures
- 2

Rack PDUs
- 3

CDUs
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rack manifold
- 7

Rear-Door Heat Exchangers
- 8

TH Sensors – 2 per rack
- 9

Remote Management
- 10

Deployment + Commissioning
- 11

Maintenance

4XL400

Contact Vertiv for Availability

High-density air-cooled retrofit

Intended for retrofit of existing air-cooled racks by adding rear door heat exchangers with indoor split chillers to boost rack density, without bringing liquid into the rack and servers. Leverage existing Vertiv™ Liebert® DSE cooling system piping and condensers.



Model Number: 4X160R



Rack Interior View

System capacity

4 Rack(s)	160 kW Total solution capacity	40 kW Load per rack
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Technologies used

Cooling Method	Air-cooled (Rear-Door Heat Exchanger)
Heat Rejection Type	Refrigerant
Key components	
Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	63A Monitored rPDU (VP7N6013)
CDU	Vertiv™ Liebert® XDM200
Busway	400A iMPB Busway, taps, and endcap
Rear-Door Heat Exchanger	4x 48U, DCD50

Dimensions (L, D, H): 23.44ft x 4.92ft x 7.22ft

What's included

- 1

Rack Enclosures
- 2

Rack PDUs
- 3

Indoor Split Chiller
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rear-Door Heat Exchangers
- 7

TH Sensors – 2 per rack
- 8

Remote Management
- 9

Deployment + Commissioning
- 10

Maintenance

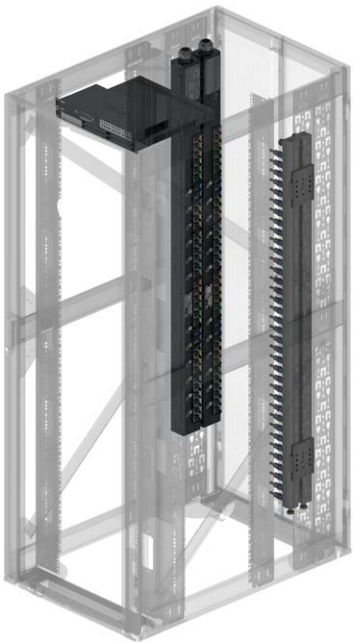
4X160R

Contact Vertiv for Availability

Liquid to liquid direct-to-chip for early adoption

Intended to replace and optimize existing footprint for high-density and AI applications. Combines the use of liquid cooling direct-to-chip with air cooling to cover the remaining capacity.

Model Number: 5L500



Rack Interior View

System capacity

5

Rack(s)

500 kW

Total solution capacity

100 kW

Load per rack

Technologies used

Cooling Method	Direct-to-chip (liquid)
Heat Rejection Type	Water/Glycol
Key components	
Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
CDU	2x Vertiv™ Liebert® XDU450
Busway	800A iMPB Busway, taps, and endcap

Dimensions (L, D, H): 17.02ft x 3.94ft x 7.22ft

What's included

- 1

Rack Enclosures
- 2

Rack PDU
- 3

CDUs
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rack manifold
- 7

TH Sensors – 2 per rack
- 8

Remote Management
- 9

Deployment + Commissioning
- 10

Maintenance

5L500

Contact Vertiv for Availability

Liquid to liquid direct-to-chip with heat reuse at scale

Intended to for large, new deployments that require heat capture for room neutrality. Combines the use of direct-to-chip liquid cooling with a rear door heat exchanger.

Model Number: 12XL1200



System capacity

12 Rack(s)

1,200kW Total solution capacity

100 kW Load per rack

Technologies used

Cooling Method	Direct-to-Chip + Rear-Door Heat Exchanger
Heat Rejection Type	Water/Glycol

Key components

Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
CDU	Vertiv™ Liebert® XDU1350, XDU600
Busway	3x 600A iMPB Busway, taps, and endcaps
Rear-Door Heat Exchanger	12x 48U, DCD35

Dimensions (L, D, H): 36.35ft x 3.94ft x 7.22ft

What's included

- 1

Rack Enclosures
- 2

Rack PDU
- 3

CDUs
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rack manifold
- 7

Rear-Door Heat Exchangers
- 8

TH Sensors – 2 per rack
- 9

Remote Management
- 10

Deployment + Commissioning
- 11

Maintenance

12XL1200

Contact Vertiv for Availability

Liquid to liquid direct-to-chip at scale

Intended for large, new deployments. Combines the use of direct-to-chip liquid cooling with existing air cooling to cover the remaining capacity.

Model Number: 14L1400



System capacity

14

Rack(s)

1,400kW

Total solution capacity

100 kW

Load per rack

Technologies used

Cooling Method	Direct-to-chip (liquid)
Heat Rejection Type	Water/Glycol
Key components	
Rack Enclosures	48U, 800mm x 1200mm (VR9357)
Rack PDUs – 2 per rack	80A Monitored rPDU (VP7UA001)
CDU	2x Vertiv™ Liebert® XDU1350
Busway	4x 600A iMPB Busway, taps, and endcaps

Dimensions (L, D, H): 42.58ft x 3.94ft x 7.22ft

What’s included

- 1

Rack Enclosures
- 2

Rack PDU
- 3

CDUs
- 4

Busway, Taps, Endcap
- 5

Row manifold
- 6

Rack manifold
- 7

TH Sensors – 2 per rack
- 8

Remote Management
- 9

Deployment + Commissioning
- 10

Maintenance

14L1400

Contact Vertiv for Availability

