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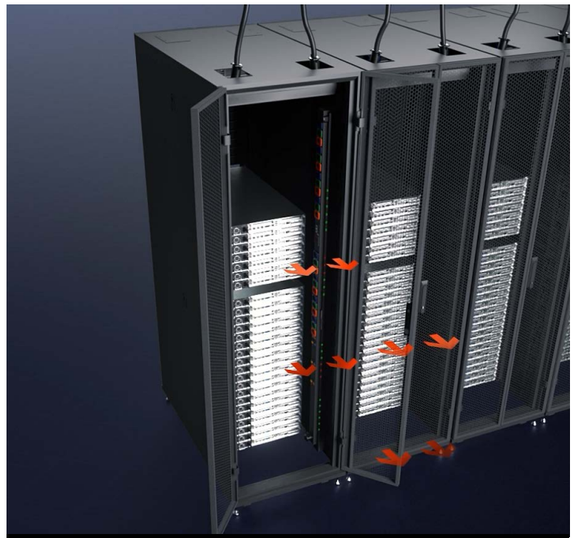
Vertiv™ 360AI

Solution brief

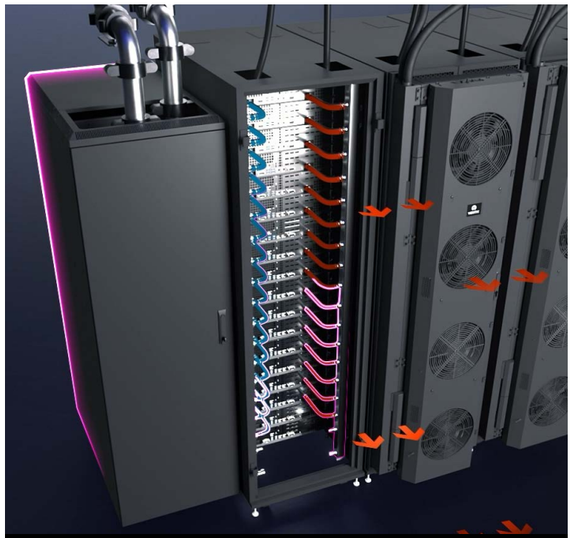
Vertiv.com

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.



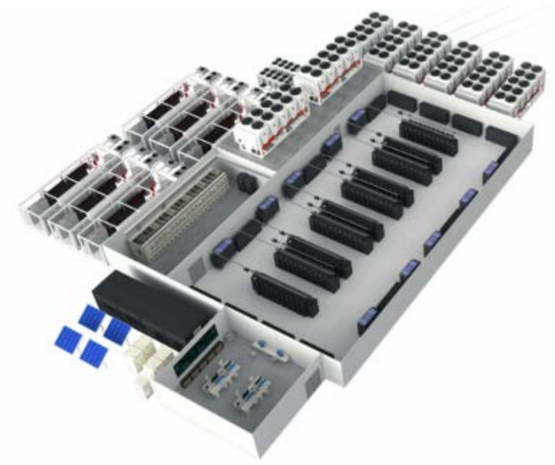
Standard CPU
Hot air from server fans



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

The better way to power and cool AI

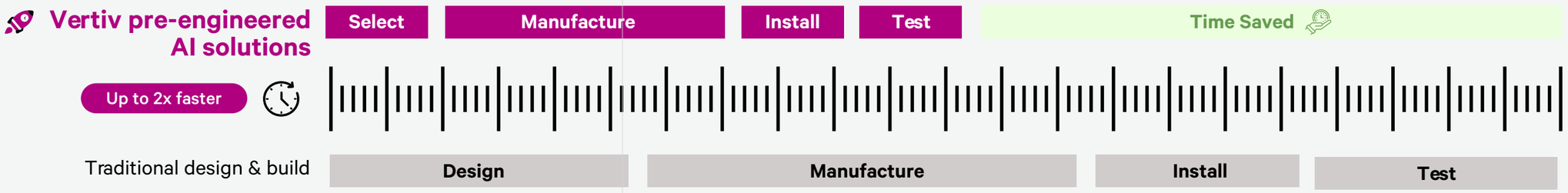
Vertiv™ 360AI provides a complete solution to power and cool high-performance computing, accelerate deployment, and keep AI applications running at peak performance. Within the Vertiv 360AI portfolio, Vertiv's pre-engineered solutions help to navigate the complex challenges arising from the AI revolution and provide a faster and easier path for customers to deploy AI infrastructure.



- Power
- Digitalized Management
- Cooling
- Lifecycles Services
- Enclosures & Structures

Accelerate your ROI on AI

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



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).

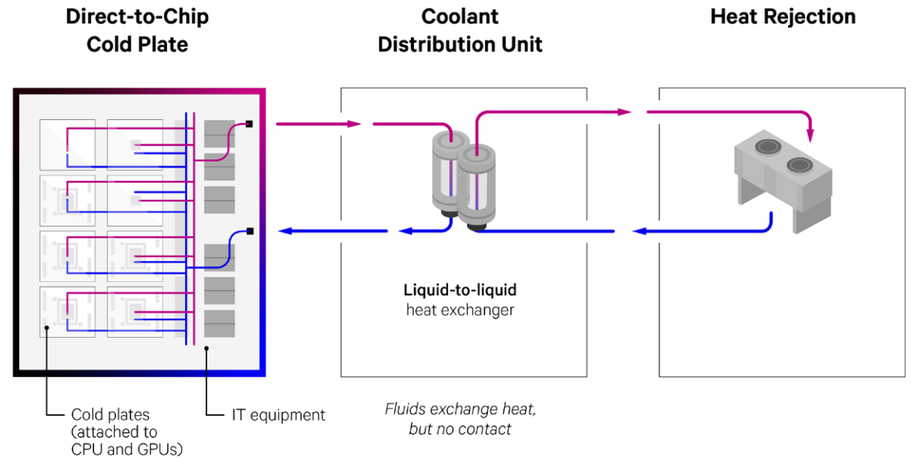
[1] Vertiv management estimate based on direct market research on pre-engineered solutions, actual results will vary.

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.

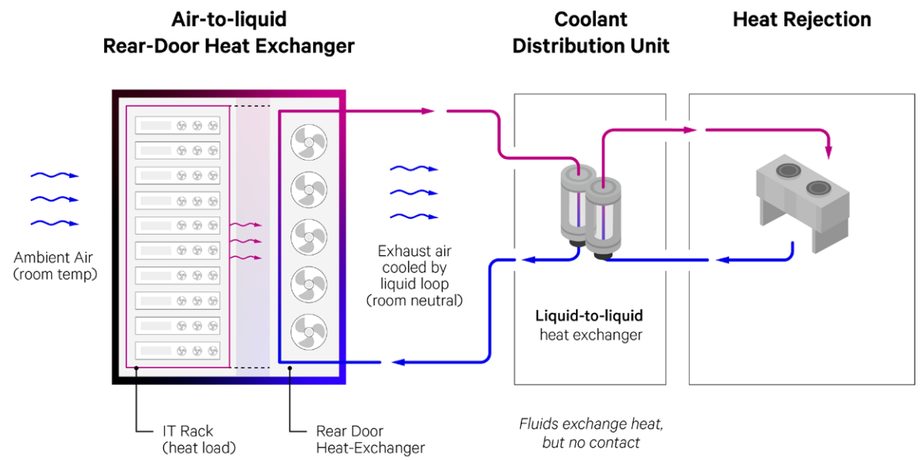
Direct-to-Chip liquid cooling

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



Rear-Door heat exchangers

Air to Liquid (A2L)

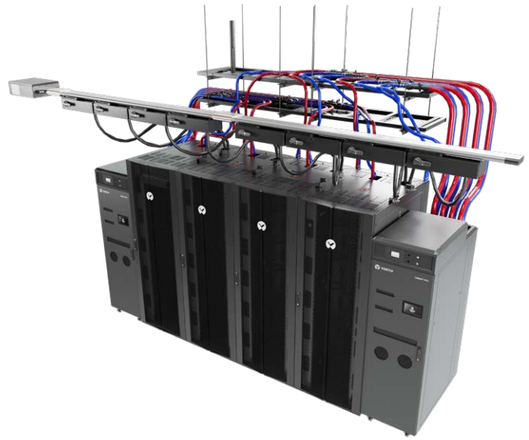


Kickstart AI deployments with pre-engineered solutions

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

AI test environments, training pilots, or edge inferencing

AI labs, transitions to AI data centers



Prototype AI factory and training

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	*1L88R*	1	88kW	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	**1L88R**	**1L100R**	**4L400R**	**4XL400**	**4X160R**	**5L500**	**12XL1200**	**14L1400**
Rack quantity	1	1	4	4	4	5	12	14
Rack density	88	100	100	100	40	100	100	100
Rear-Door heat exchanger included				X	X		X	
Total system capacity[1]	88	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

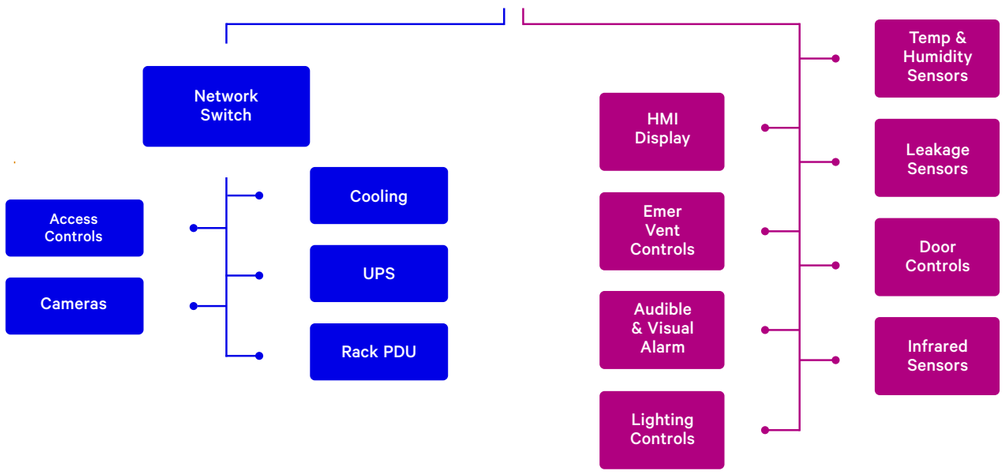
Integrated monitoring & remote management

Infrastructure management gateway appliance

RS485 Serial Communication

TCP/IP Network Communication

Web portal access
built into gateway



End-to-end services for seamless AI deployments

End-to-end lifecycle services are included with Vertiv™ 360AI solutions to streamline deployment and maintain high-density infrastructure, including liquid cooling systems.

Deployment

- Site assessment.
- Design.
- Project management.

Commissioning

- Installation.
- Startup.
- Testing.
- Complete packages available with commissioning levels L1 to L5 overseen by specialized Vertiv project managers guiding to every step of the way.

Maintenance

- Preventative maintenance.
- Fluid management.
- Troubleshooting.
- Liquid-Cooling Ready fluid management capabilities include coolant sampling, quality testing, adjusting, and ecological disposal.

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.

240+
Service Centers

3,700+
Field Engineers

200+
Tech Response

Americas

100+
Service Centers

1,700+
Field Engineers

70+
Tech Response

Europe, Middle East, and Africa

60+
Service Centers

700+
Field Engineers

100+
Tech Response

Asia Pacific

80+
Service Centers

1,400+
Field Engineers

20+
Tech Response

Liquid to air direct-to-chip retrofit

Model Number: 1L88R

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.

Rack Interior View

System capacity

1	Rack(s)
88 kW	Total solution capacity
88 kW	Load per rack

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	80A Monitored rPDU (VP7UA002)
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

1L88R

Contact Vertiv for Availability

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

Model Number: 1L100R

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.

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

System capacity

1	Rack(s)
100 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 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

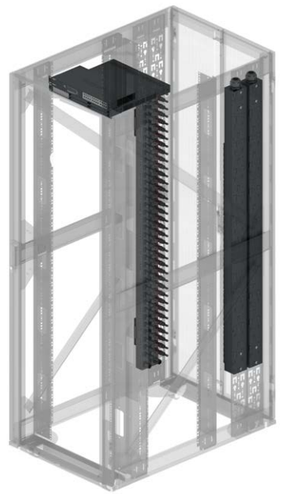
1L100R

Contact Vertiv for Availability

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

Model Number: 4L400R

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.



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

Model Number: 4XL400

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

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

Model Number: 4X160R

Retrofit existing air-cooled environments without disrupting existing workloads. This solution includes rear-door heat exchangers with indoor split chillers to remove residual heat from liquid-cooled servers before it is forced into the space. There is no need to have chilled water loops on site, the indoor split chillers included are refrigerant-based and are designed to retrofit existing Vertiv™ Liebert® DSE cooling units and reuse the existing refrigerant piping and heat rejection.

Rack Interior View

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

System capacity

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

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

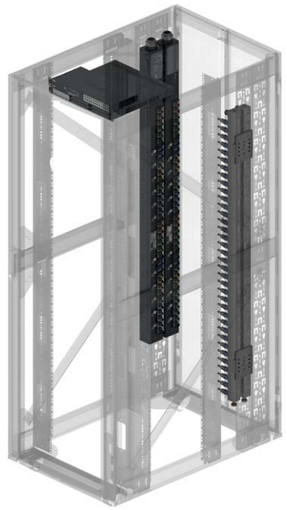
4X160R

Contact Vertiv for Availability

Liquid to liquid direct-to-chip for early adoption

Model Number: 5L500

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.



Rack Interior View

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

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

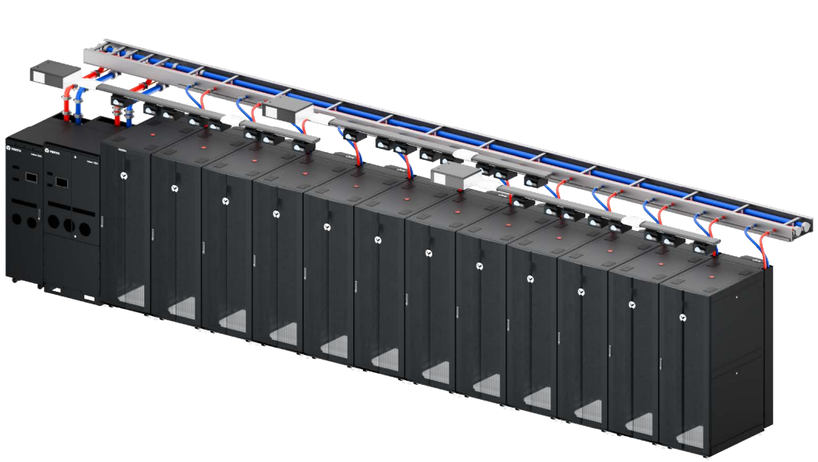
5L500

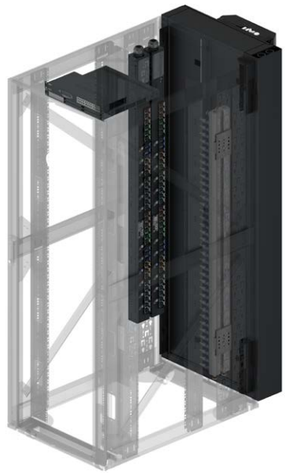
Contact Vertiv for Availability

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

Model Number: 12XL1200

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.





Rack Interior View

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

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

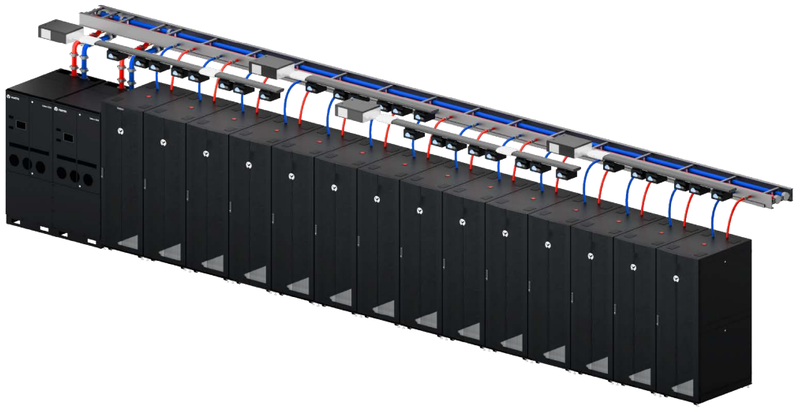
12XL1200

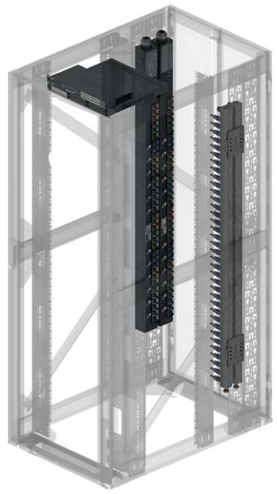
Contact Vertiv for Availability

Liquid to liquid direct-to-chip at scale

Model Number: 14L1400

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





Rack Interior View

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

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