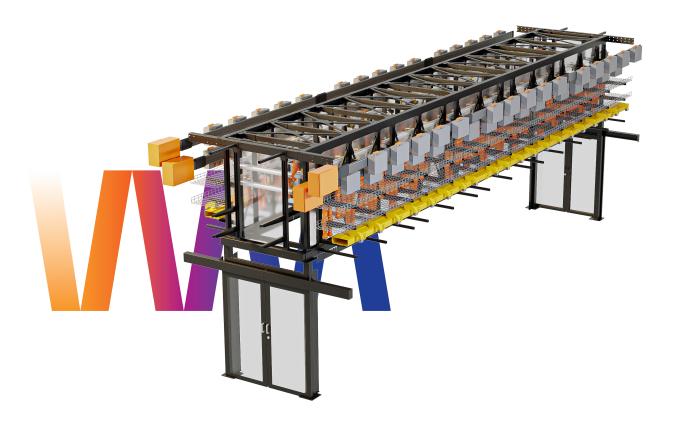


# **Product brochure**

# Vertiv<sup>™</sup> SmartRun

Integrated overhead IT solution







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# About Vertiv

**Vertiv (NYSE: VRT)** brings together hardware, software, analytics and ongoing services to enable its customers' vital applications to run continuously, perform optimally and grow with their business needs. Vertiv solves the most important challenges facing today's data centers, communication networks and commercial and industrial facilities with a portfolio of power, cooling and IT infrastructure solutions and services that extends from the cloud to the edge of the network.

Headquartered in Columbus, Ohio, USA, Vertiv does business in more than 130 countries. For more information, and for the latest news and content from Vertiv, visit Vertiv.com.



# Vertiv<sup>™</sup> infrastructure solutions at-a-glance

Vertiv<sup>™</sup> Infrastructure Solutions offers you comprehensive support for designing data centers, utilizing the entire Vertiv<sup>™</sup> product lineup to deliver seamlessly integrated solutions. By combining our extensive portfolio and expertise, we create prefabricated and modular solutions tailored both for AI and traditional data centers. With a platform-based approach, we eliminate the challenges of selecting individual products and managing on-site integration, enabling you to build an efficient, resilient, and future-ready data center infrastructure.



**Gobal presence** with localized volume manufacturing facilities

zed ities



Simplified and Scalable assembly for straightforward on-site installation



**Full owners** of the process from design to onsite installation



High quality Factory Integration with schedule and cost certainty



**Energy Efficient Design** allows for lower site PUE and reduced environmental impact while controlling costs

Vertiv<sup>™</sup> Infrastructure Solutions bring over two decades of experience in deploying prefabricated and modular solutions across the world to different industries and customer profiles.

| Accelerating Deployment Cycles                     | <ul> <li>Repeatable factory-integration to reduce deployment<br/>up to 50% and 50% less on-site work (including commissioning)</li> <li>Global supply-chain and service delivery footprint</li> </ul> |
|--|---|
| Maximizing Building Blocks<br>& Space Optimization | <ul> <li>Modular and hybrid solutions in multi-MW sizes</li> <li>Module design-practice unlocks up to 30% space</li> </ul>  |
| Reduce Field Work and<br>Improve Build Quality     | Productizing non-repeatable field work in the factory, improving build-quality and <b>customer's total cost of ownership up to 25%</b>  |

Scan QR code and visit Vertiv Infrastructure Solution page.





# Vertiv<sup>™</sup> SmartRun: simplifying overhead infrastructure for modern data centers

Vertiv<sup>™</sup> SmartRun is a prefabricated overhead infrastructure solution engineered to accelerate deployment, reduce on-site complexity, and deliver repeatable, scalable performance in data center whitespace. Designed and built by Vertiv, the Vertiv<sup>™</sup> SmartRun integrates critical systems—busway, aisle containment, piping, and cabling—into a single, lift-and-set deployment model that transforms how infrastructure is installed above the rack.

Data center providers are demanding speed—yet today's on-site construction is plagued by delays, complex coordination, and material waste of up to 10–15%. Vertiv<sup>™</sup> SmartRun addresses these challenges by **reducing on-site installation time by up to 85%, and lowering total deployment costs of aisle-based systems by up to 40%**, solving both the schedule risk and the first cost barrier.



Vertiv<sup>™</sup> SmartRun, ready for rack deployment

# Vertiv<sup>™</sup> SmartRun key benefits

- One Integrated System, One Purchase: No more sourcing busway, piping, and aisle containment separately Vertiv<sup>™</sup> SmartRun is delivered as a unified solution, fully engineered and pre-integrated.
- Streamlined Logistics & Procurement: Single-source procurement and limited shipments simplify project receipting and vendor management.
- Accelerated Deployment: Up to 85% faster deployment on-site compared to traditional stick-built infrastructure.
- Reduced On-Site Labor: Prefabricated assemblies minimize labor hours and reduce skilled trade dependencies.
- Lower Capex: Cuts total cost of aisle-based infrastructure deployment by up to 40%.
- Guaranteed Timelines: Vertiv manufacturing and project management enables predictable delivery and execution.

5

are shipped ready to install with a forklift or lift assist minimizing disruption and maximizing speed.
Scalable Modularity: Configurable to fit a wide range of data center layouts and performance requirements.

Rapid Installation with Single-Lift Deployment: Modules

 Global Reach, Local Execution: Vertiv's worldwide manufacturing and service footprint enables rapid, consistent deployments anywhere.

# **Perfect for:**

- Hyperscale data centers
- Colocation facilities
- Al infrastructure deployments
- High-performance computing environments

# Vertiv<sup>™</sup> SmartRun key features:

- Modular & Adaptable: Vertiv<sup>™</sup> SmartRun connects like building blocks, allowing flexible layouts for both new and existing spaces.
- **Easy Indoor Delivery:** Designed to move smoothly through standard doors and hallways without special equipment or disassembly.
- Flexible Installation: Can be securely mounted to the floor or suspended overhead, depending on space and design needs.
- **Ready for Liquid Cooling:** Built to integrate seamlessly with advanced cooling systems to manage high-performance heat loads.
- **Supports High Power Use:** Compatible with a variety of power setups, making it ideal for demanding, high-density environments.
- **Built-In Containment:** Includes airflow management features that improve cooling efficiency and system performance.
- **Clean Cable Management:** Features structured pathways for data and power, keeping infrastructure neat, scalable, and easy to service.



Learn more about Vertiv™ SmartRun

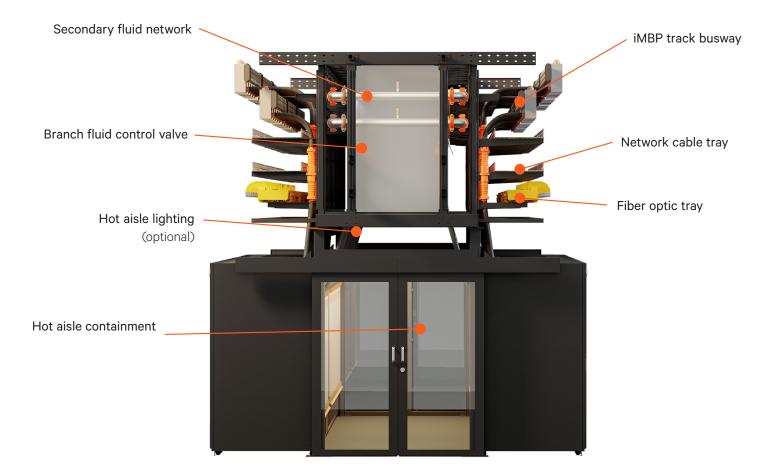


Explore a 3D model of Vertiv™ SmartRun





# Vertiv<sup>™</sup> SmartRun Prefabricated Solutions



Frontal view of Vertiv<sup>™</sup> SmartRun with racks

# Power distribution: scalable and flexible

- Supports Vertiv™ iMPB Open Channel Busway solutions up to 1000A
- Up to 600V power systems with scalable tap-off boxes for racks up to 200kW
- Flexible redundancy options: N, N+1, 4N/3, 2N architectures
- Pods supporting up to 3.3 MW IT load

# Liquid cooling: precision-controlled network

- 4" or 6" (DN100 or DN150) stainless steel headers with outlet ports every 2' (600 mm)
- Each branch supplied with an Isolation Valve and configurable options for Valve Trains allowing hot-swappable branches for fast upgrading/retrofitting/future-proofing
- Single Vertiv<sup>™</sup> SmartRun easily supports up to 3.3MW of liquid cooling enabling AI Racks
- Optional row leak detection for real-time monitoring of potential fluid leaks, enabling operational integrity and peace of mind

• Up to 3 tiers of cable trays per row

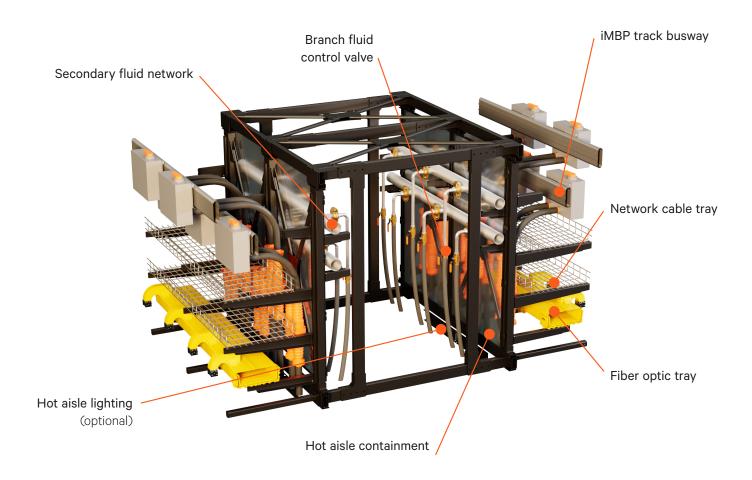
# Hot aisle containment: premium, scalable, and optimized for efficiency

- Polycarbonate containment panels provide a sleek, durable, and transparent solution for maintaining optimal airflow and temperature control
- Designed to perfectly fit racks of different heights, with adjustable filler panels to seal gaps where racks haven't been installed, maintaining airtight containment
- Premium sliding Vertiv doors feature a high-end, seamless design for easy access, while maintaining the integrity of the containment system
- Optional Integrated Lighting for increased integration solution

Networking: structured and service-friendly

# **Configurability and scalability**

- Pre-configured 8' (2.4 m) blocks for easy shipping and handling
- Configurable for rows of 24 racks long or greater
- Adjustable aisle widths and post heights for optimal fit and airflow





# Vertiv<sup>™</sup> SmartRun: modular by design

Vertiv<sup>™</sup> SmartRun delivers a modular, preassembled overhead infrastructure system that adapts to your space, accelerates deployment, and scales effortlessly across sites:

# **Portable subassemblies**

- Preassembled and shippable for quick, low-impact installation as needed
- Designed to fit through standard double doors—ideal for retrofits
- Simplifies logistics with single-lift deployment

### **Configurable layouts**

- Supports single-row or pod configurations
- Modular block design scales with whitespace demands

### Tailored to your space

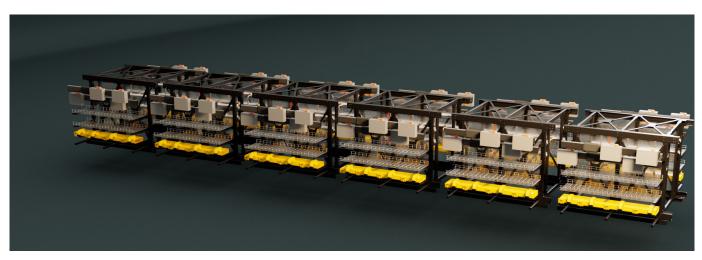
- Built in 8' (2.4m) length segments (blocks) with adjustable width and height
- Adapts to rack heights, aisle spacing, and airflow needs
- Flexible to meet accessibility and facility constraints

### **Repeatable at scale**

- Standardized design for consistent global deployment
- Easily replicates across multiple sites with minimal rework
- Sustainable deployment by reusing packaging materials for scalable deliveries



One half of a cross-section of Vertiv<sup>™</sup> SmartRun



Vertiv™ SmartRun can be delivered in smaller preconfigured blocks or as a single block

# **Technical features**

# Vertiv<sup>™</sup> SmartRun cooling loop architecture

Every pod includes a Supply (Cold) and Return (Hot) 304L stainless steel technology cooling loop for high-performance IT loads. The configuration of these headers can be tailored to your capacity and redundancy needs.

### Single-feed header architecture

- Liquid is delivered from one side of the pod, with headers running the full length of the IT row.
- Reduces overall piping and connection points for a simpler, lowercost installation.
- Ideal for standard capacity and straightforward layouts.

#### **Dual-feed header architecture**

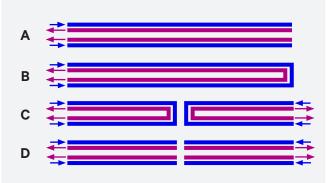
- Liquid is supplied from both sides of the pod, with each header spanning half the length of the row.
- Allows for higher cooling capacity per pod, supporting denser IT deployments.
- Requires more piping terminations but enables scalable growth and balanced flow distribution.

#### **Ring header**

- Integrates a ring connection between supply and return headers within the pod.
- Provides the ability to maintain partial flow even when isolating one side of the piping system.

# Technology cooling loop

Architecture & sizing



|   | Cooling Load Capacity <sup>1</sup>     | 4" / DN100<br>Piping | 6" / DN150<br>Piping |
|---|--|----------------------|----------------------|
| Α | Single Fed Row                         | 1500 kW              | 3340 kW              |
| в | Single Fed Row with<br>Ring Redundancy | 750 kW               | 1670 kW              |
| с | Double Fed Row with<br>Ring Redundancy | 1500 kW              | 3340 kW              |
| D | Double Fed Row                         | 3000 kW              | 6680 kW              |

<sup>1</sup>Cooling Load for entire layout shown, assuming 1.5lpm/kW (dT = 10°C), 8ft/s max fluid velocity, PG25

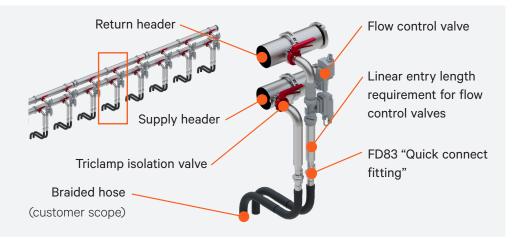
- Valuable for planned maintenance or fault isolation—e.g., servicing a Vertiv<sup>™</sup> CoolChip CDU or upstream mechanical connections—without full pod shutdown.
- Reduces Cooling Capacity of Network

#### Valve train

Architecture & sizing

| Valve Train Size | Rack Density |
|------------------|--------------|
| 1" / DN25        | 120 kW       |
| 1.5" / DN40      | 200 kW       |
| 2" / DN50        | 300 kW       |
| 2.5" / DN65      | 400 kW       |
| 3" / DN80        | 500 kW       |

All fluid piping utilizes sanitary (hygienic) connection standards





# Vertiv<sup>™</sup> SmartRun valve train

As datacenters transition to liquid cooling to support high-density AI and compute workloads, the secondary fluid piping system becomes a mission-critical backbone. Proper valve selection isn't just about initial performance — it's about long-term reliability, protection, and operational efficiency.

#### Key Vertiv<sup>™</sup> SmartRun valve train features:

#### Protects critical server infrastructure

- Liquid is a powerful but sensitive thermal medium.
- Inconsistent flow or pressure can overheat or damage high-value servers.
- Proper valve selection enables each rack gets stable, reliable cooling—no matter what's happening upstream or downstream.
- Advanced telemetry provides critical feedback for monitoring or control.

#### Enables system safety and leak protection

- Fast-acting isolation valves can shut off cooling to a row or rack instantly if a leak is detected.
- Optional leak detection systems work in tandem with control valves to mitigate risk quickly.
- Protects against fluid intrusion and equipment downtime.

#### Supports flexibility and growth

- Use adjustable balancing valves or pressure-independent valves for easier upgrades and future expansion.
- Maintain optimal flow even when adding or removing servers—no full-system rebalancing needed.
- Smart valve models can be upgraded with actuators later, supporting automation, BMS integration, and scalability.

#### Simplifies maintenance and commissioning

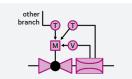
- Each rack can be serviced or adjusted without affecting neighboring equipment.
- Clear flow control at the branch level reduces the risk of error during maintenance.
- Helps operations teams diagnose and respond to issues faster.

#### Improves energy efficiency

- Thermal control valves modulate flow based on real-time heat load.
- Reduces unnecessary pump energy and improves chilled water efficiency.
- Enables smarter thermal performance with lower operating costs.

#### Valve train selection table

| Scenario | Customer Need   | Valve Options                                   | What it does   | When to use it                                     |
|----------|---|---|--|--|
| Α        | Cooling must adjust based<br>on Al load or temperature              | Smart Valve (EPIV or BEV)                       | Automatically adjusts<br>water flow                                  | Best for systems with<br>changing loads            |
| в        | Fixed flow needed at each<br>rack with no future change<br>expected | ABV (Automatic Balancing<br>Valve) (upgradable) | Maintains constant flow<br>mechanically, no power/<br>control needed | Ideal for simple, steady-<br>state cooling designs |
| с        | Need a low-cost or flexible design                                  | Manual Balancing Valve                          | Set flow manually now, but<br>add an actuator later if<br>needed     | Good for budget-con-<br>scious or evolving systems |
| D        | Leak safety – shut off<br>water instantly                           | Fast Shut-Off Valve                             | Closes when signaled   | Protects equipment in<br>emergencies               |



A: SmartValve (EPIV or BEV)



B: Auto Balancing Valve (ABV)



C: Manual Balancing Valve



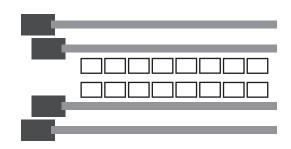
D: Fast Shut-Off Valve

# Vertiv<sup>™</sup> SmartRun electrical architecture

Vertiv<sup>™</sup> SmartRun electrical architecture is shaped by the required power capacity, desired redundancy level (N, N+1, 4N/3, 2N) and the layout of the IT row. Designs may use one or two Vertiv<sup>™</sup> iMPB open channel busways per row, depending on whether power is fed from one side or both. Two-sided feeds require upstream planning for cable routing. Tap-off boxes must match rack density and distribution needs, and all decisions should be closely coordinated with the overall datacenter design to ensure scalability, efficiency, and reliability.

#### Single fed power architecture

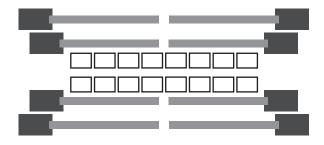
- Liquid is delivered from one side of the pod, with headers running the full length of the IT row.
- Reduces overall piping and connection points for a simpler, lowercost installation.
- Ideal for standard capacity and straightforward layouts.



|        |         | 1 Busway per Row 2 Busways per Row |          |          | 1 Busway per Row         2 Busways per Row         4 Busways per Row |          |          |          |          |          |          |          |
|--------|---------|------------------------------------|----------|----------|--|----------|----------|----------|----------|----------|----------|----------|
| kVA    | 208 V   | 400 V                              | 480 V    | 600 V    | 208 V  | 400 V    | 480 V    | 600 V    | 208 V    | 400 V    | 480 V    | 600 V    |
| 400 A  | 288 kVA | 554 kVA                            | 664 kVA  | 830 kVA  | 576 kVA  | 1107 kVA | 1329 kVA | 1661 kVA | 1151 kVA | 2214 kVA | 2657 kVA | 3322 kVA |
| 600 A  | 432 kVA | 830 kVA                            | 996 kVA  | 1246 kVA | 864 kVA  | 1661 kVA | 1993 kVA | 2491 kVA | 1727 kVA | 3322 kVA | 3986 kVA | 4982 kVA |
| 800 A  | 576 kVA | 1107 kVA                           | 1329 kVA | 1661 kVA | 1151 kVA   | 2214 kVA | 2657 kVA | 3322 kVA |          |          |          |          |
| 1000 A | 720 kVA | 1384 kVA                           | 1661 kVA | 2076 kVA | 1439 kVA   | 2768 kVA | 3322 kVA | 4152 kVA |          |          |          |          |

#### Dual fed power architecture

- Liquid is supplied from both sides of the pod, with each header spanning half the length of the row.
- Allows for higher cooling capacity per pod, supporting denser IT deployments.
- Requires more piping terminations but enables scalable growth and balanced flow distribution.



|        |          | 1 Busway per Row 2 Busways per Row |          |          | 4 Busways per Row |          |          |          |          |          |          |          |
|--------|----------|------------------------------------|----------|----------|-------------------|----------|----------|----------|----------|----------|----------|----------|
| kVA    | 208 V    | 400 V                              | 480 V    | 600 V    | 208 V             | 400 V    | 480 V    | 600 V    | 208 V    | 400 V    | 480 V    | 600 V    |
| 400 A  | 1151 kVA | 2214 kVA                           | 2657 kVA | 3322 kVA | 1151 kVA          | 2214 kVA | 2657 kVA | 3322 kVA | 2303 kVA | 4429 kVA | 5315 kVA | 6643 kVA |
| 600 A  | 1727 kVA | 3322 kVA                           | 3986 kVA | 4982 kVA | 1727 kVA          | 3322 kVA | 3986 kVA | 4982 kVA | 3454 kVA | 6643 kVA | 7972 kVA | 9965 kVA |
| 800 A  | 2303 kVA | 4429 kVA                           | 5315 kVA | 6643 kVA | 2303 kVA          | 4429 kVA | 5315 kVA | 6643 kVA |          |          |          |          |
| 1000 A | 2879 kVA | 5536 kVA                           | 6643 kVA | 8304 kVA | 2879 kVA          | 5536 kVA | 6643 kVA | 8304 kVA |          |          |          |          |



### Vertiv<sup>™</sup> PowerBar iMPB technical features

Vertiv<sup>™</sup> PowerBar iMPB is constructed from high density 99.99% conductivity copper or 55% conductivity aluminum. The conductors are insulated with a custom

IEC certified thermoplastic material with outstanding heat characteristics. The insulation has excellent dielectric strength and is impact resistant.

### **Key features:**

- SafeWork technology
- Individual tap-off units rated up to 125A
- Interlock feature minimizes risk of mismatching polarities
- Tap-off units can be fitted with IEC 309 receptacles, NEMA receptacles or whip cords as required

Vertiv PowerBar iMPB is constructed with an aluminium housing providing a durable structure which also acts as a ground path.

The Vertiv PowerBar iMPB range can be engineered with an over-rated neutral option for busbar systems with non-linear loads. The additional neutral capacity prevents overloading caused by zero sequence harmonic currents.

Vertiv offer a 100% fully isolated ground for systems where earth isolation is required e.g. systems with heavy microprocessors, based loads or large computer-based installations.

#### Vertiv<sup>™</sup> PowerBar iMPB tap off units are engineered with the safety of the installer and user as the key criteria.

All tap off units have an 'earth first, break last' safety feature and can be safely installed using Powerbar's SafeWork Technology.

1. The units interlock onto the busway with a ground strip. This is designed to make ground the first point of contact with the busbar system during installation.

2. The mechanical interlock secures the unit to the bar using high tensile strength lockable hardware which cannot be fitted incorrectly.

3. Once fitted to the bar, the engager handle can be turned. This lifts the contacts into the busway and has a positive lock once fully rotated.



Earth

600

1000

100

1000

#### **Technical Data**

| Copper                                  |      |      |      |      |      | Phase Con     | figurati | ons    |
|---|------|------|------|------|------|---------------|----------|--------|
| Rated current (A)                       | 160  | 250  | 400  | 630  | 800  |               | -        |        |
| Rated Operational Voltage               | 600  | 600  | 600  | 600  | 600  | Configuration | Phases   | Neutra |
| Rated Insulation Voltage                | 1000 | 1000 | 1000 | 1000 | 1000 | TP            | 600      | 600    |
| Short Circuit                           |      |      |      |      |      | TP/ON         | 1000     | 1000   |
| Short Circuit Current Rating            |      |      |      |      |      | TP/NE         | 100      | 100    |
| (rms symmetrical 1 second) KA           | 25   | 25   | 36   | 36   | 35   | TP/ONE        | 1000     | 1000   |
| Peak Value (kA)                         | 52.5 | 52.5 | 77   | 77   | 77   |               |          |        |
| Short Circuit Conditional Rating (KAIC) | 100  | 100  | 100  | 100  | 100  |               |          |        |
| Aluminium                               |      |      |      |      |      |               |          |        |
| Rated current (A)                       | 160  | 250  |      | 400  | 630  | 800           | 1000     |        |
| Rated Operational Voltage               | 600  | 600  |      | 600  | 600  | 600           | 600      |        |
| Rated Insulation Voltage                | 1000 | 1000 |      | 1000 | 1000 | 1000          | 1000     |        |
| Short Circuit                           |      |      |      |      |      |               |          |        |
| Short Circuit Current Rating            | 00   |      |      |      | 05   | 05            | 05       |        |
| (rms symmetrical 1 second) KA           | 30   | 30   |      | 30   | 35   | 35            | 35       |        |
| Peak Value (kA)                         | 63.8 | 63.8 |      | 63.8 | 73.5 | 73.5          | 73.5     |        |
| Short Circuit Conditional Rating (KAIC) | 100  | 100  |      | 100  | 100  | 100           | 100      |        |

# Integrate Vertiv<sup>™</sup> SmartRun into a Vertiv<sup>™</sup> unified loop system

Integrated. Certified. Mission-Critical.

Vertiv<sup>™</sup> SmartRun allows for a one-Loop System. Delivering a fully integrated liquid cooling ecosystem—combining our Vertiv<sup>™</sup> SmartRun and its secondary fluid network, industry-leading Vertiv<sup>™</sup> Coolant Distribution Units (CDUs), and thermal and power infrastructure—all engineered, manufactured, and commissioned by Vertiv.

### Why choose Vertiv's unified loop?

# Single-source confidence

Vertiv designs, manufactures, and commissions the entire cooling loop—enabling quality, speed, and accountability across every phase.

# **Protect your investment**

Liquid-cooled servers are expensive and sensitive. Our system enables cleanliness, precision flow control, and uptime protection for high-density workloads.

# **Optimized for deployment speed**

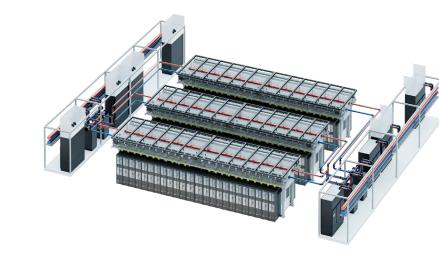
With all components built to fit together—headers, valves, racks, containment, and power—installation is faster and more consistent.

# Seamless cooling distribution unit integration

Vertiv<sup>™</sup> SmartRun pairs directly with Vertiv<sup>™</sup> CDUs, enabling precision cooling, modular scalability, and maintenance-friendly architecture.

# **End-to-end prefabrication**

Integrate prefabricated cooling skids featuring Vertiv™ CDU with Vertiv™ SmartRun for streamlined liquid loop deployment and



An example configuration with 2 air-cooling units and 2 CDUs mounted on a prefabricated skid Vertiv™ CoolChip CDU

An example of a 3-aisle compute pod, coolied by Vertiv indoor cooling units and CDUs deployed on 4 prefabricated skids







minimized field labor.

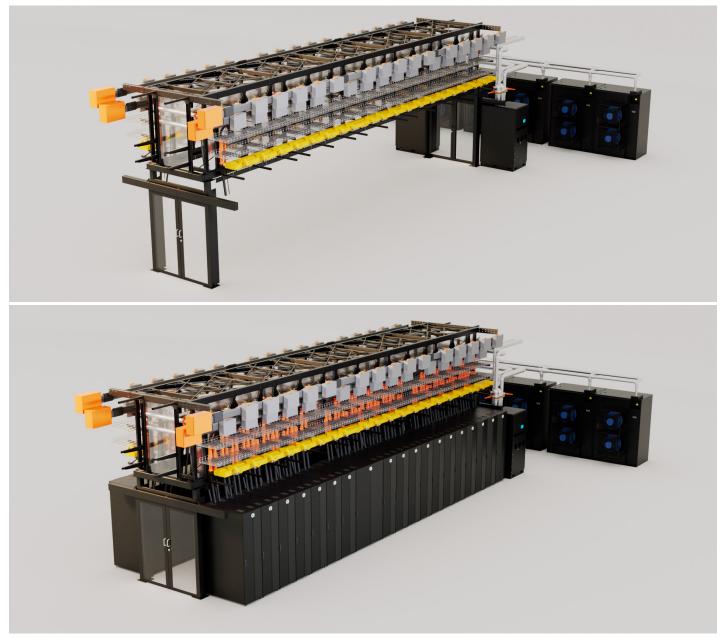
Pair with other prefabricated modules and skids for a comprehensive, factory-tested Vertiv<sup>™</sup> OneCore turn-key data center solution, reducing on-site complexity and timelines.

# **Coordinated power and thermal infrastructure**

Vertiv<sup>™</sup> SmartRun busways and containment align with Vertiv's power train and thermal chain portfolio, delivering an efficient, cohesive physical layer.

# Worry-free operation with Vertiv services

Experience seamless efficiency and reliability with Vertiv's all-inclusive design, installation, and maintenance services for liquidcooled systems.



Vertiv™ SmartRun shown alongside Vertiv perimeter air-cooling units and CDUs, with racks (bottom) and without (top)



# Vertiv<sup>™</sup> liquid cooling services at-a-glance

# **Expert turnkey services**

Deliver optimal performance for high-density computing through comprehensive infrastructure solutions. Services include site assessment, solution design, and PUE optimization. Specialized thermal experts help upgrade facilities for AI workloads, enabling scalability and efficiency from deployment through maintenance.

# **Global expertise and certified technicians**

Distinguished by integrated capabilities in designing, manufacturing, and servicing liquid cooling systems. Backed by worldwide network of certified technicians and engineers who complete extensive training programs. Provide expert guidance, from operator training to risk management, ensuring maximum data center efficiency.

# End-to-end lifecycle support

Deliver complete lifecycle services covering design, installation, and maintenance of liquid cooling systems. Utilize Digital Twin technology to validate system efficiency and design. Offer ongoing service contracts with routine maintenance and advanced monitoring, enabling optimal system performance and reliability.

# Levels of project execution

Getting critical infrastructure up and running is a multi-step approach, and liquid cooling introduces unique challenges that demand expertise at every stage. Vertiv's Liquid Cooling Services provide a structured, end-to-end approach to navigate these complexities, delivering a system designed, installed, and maintained to support scalability and future-ready operations.



| Consultation & Assesment   | Installation & Integration  |  |  |
|--|---|--|--|
| Perform design consultation and assesment customized               | Manage project and perform assembly services:   |  |  |
| to specific site requirements:                                     | • Rack assembly • Busway installation • Rack PDU installation •   |  |  |
| • Site visit • Product selection • System planning/design • System | Aisle containment • Integration from CDU to chip via overhead<br>and rack manifolds • Removal of old equipment • New Vertiv™ unit |  |  |

 Site visit • Product selection • System planning/design • System layout • Integration drawings • Computational fluid dynamic (CFD) Digital Twin modeling

Aisle containment • Integration from CDU to chip via overhead
 and rack manifolds • Removal of old equipment • New Vertiv<sup>™</sup> unit
 installation

Hassle-free design, deployment and management for forward-looking data centers in every location.

| Comissioning  | Recurring Services   |
|---|--|
| OEM commisioning and startup service:   | Preventive Maintenance Visits      Parts/Labor Coverage  |
| • Site Acceptance Inspection • Startup • Site Acceptance Testing •<br>Integration System Testing • Training | Emergency Response • Technical Support • Fluid management<br>(Fluid sampling and testing; system discharge and recharge, fluid<br>quality remediation) |



# Service offering

#### Startup and commissioning services

Our startup and commissioning services provide white-glove support, delivering precision at every stage of the installation phase. With meticulous verification and proactive engagement, we supervise installations to minimize issues and conduct full testing—both before server installation and under full load, enabling a seamless transition from system inception to full operation Leveraging real-time data analysis powered by Artificial Intelligence/Machine Learning, we detect component anomalies, monitor performance deviations, and calculate remaining useful life, helping you manage risks and maintain visibility into system performance.

#### Fluid maintenance and analyses

Proper fluid management focuses on maintaining the chemistry and quality of the coolant. Our services include coolant sampling, quality testing, and chemical adjustments, backed by partnerships with top coolant suppliers. The Secondary Fluid Network—comprising piping, hoses, and manifolds—carries coolant from the Coolant Distribution Unit (CDU) to the cold plates, requiring precise handling to avoid leaks and contamination. With quick disconnects for easier servicing and a closed-loop design for minimal fluid loss, we deliver thorough care to maintain cleanliness and system integrity. Secondary Fluid Network coolant is mission-critical, and the quality of the fluid is paramount to keeping IT systems running smoothly. Through regular monitoring and corrective actions, we prevent issues like blockages, corrosion, and reduced thermal performance, keeping your cooling systems efficient and reliable.

#### Ongoing maintenance and support

Our recurring services provide comprehensive support to keep your liquid cooling systems running smoothly, combining preventative maintenance and break-fix support. Through regular inspections, fluid management, and quality testing, we optimize system efficiency, clean filters, adjust settings, and make necessary upgrades to extend the lifespan of your equipment. By addressing wear and tear promptly and maintaining compliance with industry standards, we reduce the risk of costly repairs or replacements. Our proactive approach helps identify and resolve potential issues before they escalate, minimizing downtime and keeping your cooling systems in optimal condition.

| Global services portfolio             | Basic                 | Essential             | Preferred             | Premier  |             |
|---------------------------------------|-----------------------|-----------------------|-----------------------|--|-------------|
| PerformedbyVertivCertifiedTechnicians | $\mathbf{\mathbf{x}}$ | $\mathbf{S}$          | $\mathbf{Q}$          | _  |             |
| GuaranteedEmergencyResponseTome       | $\mathbf{\mathbf{x}}$ | $\mathbf{S}$          |                       | <b>—</b>   | <br>        |
| Access to Customer Resolution Center  | $\mathbf{\mathbf{x}}$ | $\mathbf{S}$          |                       |  | + 1100      |
| PreventiveMaintenanceServicesVisits   | $\mathbf{\mathbf{x}}$ | $\mathbf{\mathbf{S}}$ | $\mathbf{\mathbf{S}}$ |  | mann        |
| Labor and Travel Coverage             | _                     | $\mathbf{S}$          |                       | =  | )<br>)<br>) |
| Part Coverage                         |                       | —                     |                       | -  |             |
| Secondary Circuit Fluid Sampling      | $\mathbf{\Diamond}$   | $\mathbf{\mathbf{S}}$ | $\mathbf{\mathbf{x}}$ | $\mathbf{i}$   | Π           |
| Secondary Circuit Fluid Analysis*     | +                     | +                     | +                     |  |             |
| Secondary Circuit Fluid Remediation   | +                     | +                     | +                     |  | nonon.      |
| Secondary Circuit Initial Fill        | +                     | +                     | +                     | <ul> <li>♥</li> <li>♥</li> <li>♥</li> <li>+</li> </ul> |             |
| Secondary Circuit Flush and Fill      | +                     | +                     | +                     | +  |             |



| Design Specifications                             | Vertiv™ SmartRun  | <b>Reference Design 1</b>                                     | <b>Reference Design 2</b>                                     |  |  |
|---|---|---|---|--|--|
| Structural  |   |   |   |  |  |
| Minimum Shippable Size (Block) LxWxH              | 8 ' x 4' x 6.5' (2,4 x 1,2 x 2 m)                             | 8' x 4' x 6.5' (2,4 x 1,2 x 2 m)                              | 8' x 4' x 6.5' (2,4 x 1,2 x 2 m)                              |  |  |
| Max Lift Size LxWxH                               | Up to 48' x 14' x 6.5' (14,4 x 4,2 x 2 m)                     | Up to 40' x 14' x 6.5' (14,4 x 4,2 x 2 m)                     | Up to 40' x 14' x 6.5' (14,4 x 4,2 x 2 m)                     |  |  |
| Number of Racks                                   | Up to 48 Racks  | Up to 40 Racks  | Up to 40 Racks  |  |  |
| Lift Weight                                       | Up to 500lbs / ft (744 kg / m)                                | Up to 500lbs / ft (744 kg / m)                                | Up to 500lbs / ft (744 kg / m)                                |  |  |
| Operational Weight                                | Up to 600 lbs / ft (900 kg / m)                               | Up to 600 lbs / ft (900 kg / m)                               | Up to 600 lbs / ft (900 kg / m)                               |  |  |
| Mounting  | Post, Ceiling Hung, Rail Mounted                              | Post  | Post  |  |  |
| Post Height                                       | Up to 52U Rack  | Up to 52U Rack  | Up to 52U Rack  |  |  |
| Thermal   |   |   |   |  |  |
| Liquid Thermal Capacity per Pod (kW) <sup>1</sup> | Up to 3300 kW   | 1.5 MW  | 3 MW  |  |  |
| Main Header Size                                  | 4" or 6" (DN100 or DN150)                                     | 6" (DN150)  | 6" (DN150)  |  |  |
| Technology Cooling Loop Architecture              | Ring or Straight  | Ring  | Straight  |  |  |
| Piping Material <sup>2</sup>                      | 304L Stainless Steel  | 304L Stainless Steel  | 304L Stainless Steel  |  |  |
| Branch Flow Control Valving                       | Manual, Automatic, Energy Valve, Fast<br>Acting Shutoff Valve | Manual  | PICV  |  |  |
| Electrical  |   |   |   |  |  |
| Electrical Capacity per Pod (kW) <sup>3</sup>     | Up to 5500 kVA  | 2 MW  | 3.3 MW  |  |  |
| Voltage   | Up to 600 V   | 480 V   | 480 V   |  |  |
| Busway <sup>4</sup> Amperage                      | Up to 1000A Open Channel                                      | 600 A   | 1000 A  |  |  |
| Busway Quantity                                   | Up to 4 per Row   | 2 per Row   | 2 per Row   |  |  |
| Tap-off Box (Busplug)                             | Up to 125 A   | 60 A  | 125 A   |  |  |
| Auxillary   |   |   |   |  |  |
| Cable Tray Qty                                    | Up to 3 Tiers   | Up to 3 Tiers   | Up to 3 Tiers   |  |  |
| Optional to include                               | Fiber Spillout, Lighting, Leak Detection,<br>Fire Suppression | Fiber Spillout, Lighting, Leak Detection,<br>Fire Suppression | Fiber Spillout, Lighting, Leak Detection,<br>Fire Suppression |  |  |
| Containment                                       | Polycarbonate Paneling with Sliding<br>Doors                  | Polycarbonate Paneling with Sliding<br>Doors                  | Polycarbonate Paneling with Sliding<br>Doors                  |  |  |
| Color   | Black   | Black   | Black   |  |  |

<sup>1</sup>80:20 Liquid:Air, 1.5 LPM/kW, 8ft/sec.

 $^{\rm 2}$  All wetted material compliant with major PG25 manufacturers and industry standards.

<sup>3</sup> 480V with N Redundancy

<sup>4</sup> Swap for ladder tray on request

Contact Vertiv<sup>™</sup> Solutions Architect for more details. ETO Options Available upon request.



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