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Enterprise Solutions Guide

Industry Leading IT Infrastructure
and Management Solutions





Integrated Solutions

The digital transformation we will see in the next decade, including the rise of 5G, will take place mainly at the edge of the network. To create and maintain strong edge computing, solid IT infrastructure needs to be rapidly deployed in remote locations as efficiently as possible. Anticipate this trend sustainably, with Vertiv's integrated solutions, including prefabricated rack, row, aisle, and modular data centers, built in flexible designs based on proven configurations. We're here to help you normalize design and harmonize systems across all of your edge sites (locally, regionally and globally) to allow for easier design, implementation, management, and replication.

Vertiv™ SmartCabinet™ 2

Self-contained, pre-configured, pre-engineered and factory tested infrastructure solutions for data centers and telecom networks.



Vertiv™ SmartCabinet™ 2-E with self-contained cooling

Features:

- **Fully integrated** - Factory assembled and tested for power, thermal management, rack enclosure, power distribution, monitoring and management, and security for IT applications. No dedicated IT room is required.
- **Dust protection and noise insulation** - Fully closed operation, cold/hot air is circulated within the rack for better temperature and humidity control, expanding lifespan of IT equipment, low noise level. Highly suitable for office environment.
- **Highly Efficient** - Built-in high efficiency UPS and cooling equipment, that uses DC frequency conversion technology for energy savings.
- **User-friendly interface** - Large 9-inch LCD touch panel that allows for easy access to system status/alarms/ setting.
- **Fast deployment** - SmartCabinet provides faster deployment and is ready to use from day one, removing the need to build, construct and design computer rooms which dramatically reduces the required deployment period compared to a traditional IT facility build.
- **Central Management** - optional feature of RDU-M that provides central management of multiple SmartCabinet sites.



Vertiv™ SmartCabinet™ Premium with external condenser



800mm width with external condenser



600mm width with external condenser



Vertiv™ SmartCabinet™ 2-M



Vertiv™ SmartRow™ 2

Vertiv™ SmartRow™ 2 brings an innovative approach to efficiently integrate and manage distinct systems namely, Power and Distribution system, Thermal Management, System Security, Comprehensive Interface, Cable management, and other pertinent aspects. It takes over the previous generation of products' set-up and maintains the micro-module application benchmark, to provide users more compact, more reliable, safer, more convenient; a technology room deployment experience. The solution comes with the fastest deployment rate, lowest operating cost and the lowest learning curve for operation.

Features:

- Power Distribution System
- Modular Construction
- UPS System
- Precision Cooling Units
- Support Utilities
- Cable Management
- Remote Monitoring
- Advanced Touch Screen Display Controller



New Vertiv™ SmartAisle™

Vertiv™ SmartAisle™ the most advanced fully integrated data center infrastructure solution with the futuristic capabilities embedded with sophisticated technology to make the data center operations efficient, quickly deployable, and provide monitoring and control of the entire operations.

Features:

- Lowest Total Cost of Ownership Increase of 30+% cooling efficiency utilize SmartAisle™ logic ensures the most accurate cooling environment.
- An integrated design facilitates quick deployment in less than 2 weeks
- Simple Architecture, an integrated stand-alone build-to-install approach for the entire DC set-up in one go
- A 15-inch large HMI control panel enables administrators and facility managers to visualize the entire system operation in real time
- Uptime Tier IV Ready

Prefabricated Data Centers

Prefabricated modular data centers are a viable solution to scale faster to respond to the rapidly changing demands in the data center space. Unlike traditional brick-and-mortar designs, prefabricated modular data centers, or containerized data centers, are engineered to meet business-specific requirements to fit in a right-sized secure infrastructure. Vertiv's prefabricated data center modules let you expand your data center capacity wherever and whenever you need it while offering minimized cost, unmatched flexibility and scalability.

Benefits:

Rapid Deployment

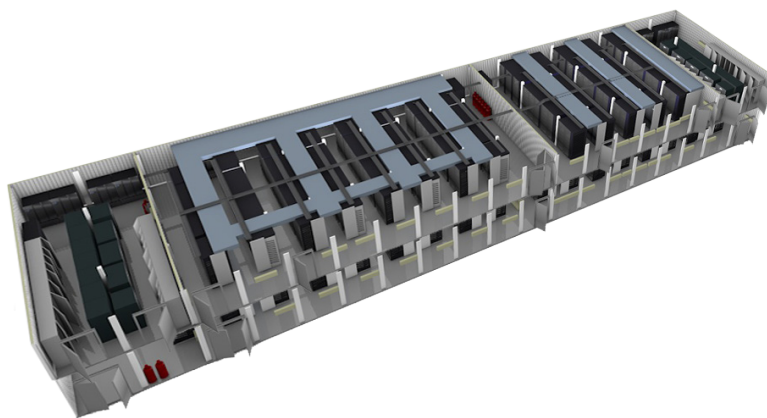
- All sub-systems are pre-assembled, fully integrated, and factory-tested with proven quality assurance processes
- Fabrication and transportation occurs in parallel with site selection, preparation, civil works, and construction
- Global manufacturing and configuration footprint enables implementation across the globe

Right-Sized Infrastructure

- Modular features allow critical power and thermal management needs are right-sized according to IT load and demand requirements
- Redundant and standardized design allows capacity adjustment to meet changing needs of the data center
- High availability and efficiency solutions that provides greater OPEX savings

Reduced Complexity

- Single point of contact from sales to project services and other engineering related requirements
- Industry leading deployment of prefabricated data centers regardless of size





Data Center Infrastructure Management

Solving the biggest data center challenges with intelligent, holistic monitoring of equipment performance and status. Improve uptime, increase efficiency and enhance capacity planning with advanced monitoring features of DCIM.

Vertiv™ Environet™ Alert

Features:

- Increase your operational awareness and visibility into key assets
- Monitor your devices via streamlined integration with other business systems
- Improve the uptime of servers with proactive threat resolution
- Save time with easier setup, management and monitoring
- Identify trends to plan and optimize operations across all locations
- Ensure consistent processes and systems across data centers and server rooms



Vertiv™ Avocent® DSView™ Management Software

Features:

- Flexibly manage operations from any location
- Single point of data center infrastructure management
- Activity logging for full operational accountability
- Zone granularity access control
- Consistent appliance firmware management
- Flexibly restore and reimage devices from virtual media
- Architected business continuity
- Secured via site authentication and web certificates



Vertiv™ Universal Management Gateway

Features:

- Provides consolidated out-of-band access to your entire IT Infrastructure
- Single console for multiple service processor types
- Environmental monitoring aggregation
- Real-time information across IT and facilities*



Vertiv™ Avocent® ADX Rack Manager

Features:

- Fastest and most feature rich KVM experience on a single device
- All digital architecture for flexible and scalable deployments
- Most expansive management of IT devices
- Resilient and secure technology supporting 100+ simultaneous users
- Common architecture with open standards, platforms and APIs



Secure Desktop KVM and KM Solutions

Features:

- Isolated ports on the switch provide discrete processing paths to each system, preventing data leakage, transfer or crosstalk between adjacent ports.
- Unique NUM Lock, CAPS Lock and Scroll Lock indicators to improve ease of use.
- An optional Dedicated Peripheral Port (DPP) provides a secure connection to common access card readers, as well as additional types of authentication devices including facial recognition scanners and fingerprint readers.
- Broad range of video connections including DVI-I, Display Port, HDMI, and support for resolutions up to UHD 4K.
- Cursor navigation switching lets users switch control between systems by simply moving the mouse cursor from one display monitor to another.
- An optional Dedicated Peripheral Port (DPP) provides a secure connection to common access card readers, as well as additional types of authentication devices including facial recognition scanners and fingerprint readers.



Vertiv™ Avocent® LV5500 / Avocent® LV5520 KVM Extender Series

Features:

- **Fiber or Copper Option** - Connect the transmitter and receiver with only a single fiber or copper cable. Expand the range and bandwidth of the KVM extender up to 4km with the fiber cable option.
- **Local Port Pass Through (Single Head)** - Allows up to two users, local and remote, simultaneous access to the same machine.
- **USB 2.0 True Emulation (Dual Head)** - Device USB emulation ensures the computer will boot without the Rx connected and allows dual PC operation.



Vertiv™ Smart Infrasight

Features:

- Alarm notifications via email, SMS and on-screen icons
- Auto discovery of Liebert® RDU-A devices
- Drag-and-drop 3D modelling
- Power usage, temperature and humidity monitoring
- Up to 9 HD video streams
- Entry control via access cards
- REST API protocol compliant



Vertiv™ Liebert® RDU-M

Features:

- Offers a user-friendly GUI to set up and manage data center infrastructure appliances
- Real-time monitoring on environmental, power, cooling, and security in data center
- Video surveillance supports video recording/backup/replaying/picturecapturing/voice transmission/timed recording and recording action triggered by alarm
- Room access control management
- Relay actions triggered by alarm or events
- Alarm notification by Email, SMS
- Report and analysis on data center/device operation; PUE statistics



Vertiv™ Avocent® HMX 3080/4080

Features:

- Distributed IP matrix architecture
- The switching speed time is less than one second between target computers
- Multicast 1:1 pixel mapping with instant video transmission
- Support two-way audio, USB2.0 pass-through transmission, RS232 serial port or IR infrared transmission
- The built-in SFP port supports fiber optic fiber access
- Supports Video Wall set up (2x2, 4x4, 8x8)
- Supports mouse slide roaming
- Supports agent push and share function, can be used to monitor the screen push of the large screen
- Supports group preset. Screen of multiple receivers can be switched with one click
- PoE (Power Over Ethernet) power supply is supported (selected models)



Vertiv™ Liebert® RDU-A G2

The Liebert RDU-A G2 allows data center managers to perform the following operations through a secure web page:

Features:

- Monitoring of the health and status of the equipment.
- Monitoring of environmental conditions i.e. temperature and humidity, leak and smoke.
- Monitor the improved communication speed in transmitting control or commands to the equipment and parameter setting
- Records Data and Logs of historical information of alarms and notifications
- 3rd Party Communications:
- SNMP
 - Modbus 485
 - Dry contacts
 - Analog Signals



Vertiv™ Avocent® ACS8000 Advanced Console Systems

Features:

- Fast, automated configuration with Zero Touch Provisioning
- Access and troubleshoot remote locations using automatic network failover to cellular (and failback)
- No need for adaptors with automatic Cyclades™ and Cisco pin-out conversions
- Expanded support for Rack PDUs from Vertiv, ServerTech, APC, Raritan and Eaton
- Support for Vertiv GXT4 UPS systems
- Integrated support for 1Gb SFP fiber modules
- 8 USB ports to support new IT equipment and external devices



Vertiv™ Liebert® RDU501

Features:

- Monitoring of the health and status of the equipment
- Monitoring of environmental conditions i.e. temperature and humidity, leak and smoke.
- Monitor the improved communication speed in transmitting control or commands to the equipment and parameter setting
- Records Data and Logs of historical information of alarms and notifications



Vertiv™ Avocent® HMX 5000/6000 Series High Performance KVM Systems

Features:

- Eliminates Distance Limitations within the LAN
- High-Quality DVI Video and CD Audio
- Centralized Management
- Centralized, User-Rights Management
- Greater Security
- No Dedicated Cabling
- Dual, Digital DVI Video
- USB Support
- Interoperability





Uninterruptible Power Supplies

The critical systems that sustain your business operations can't go down. Vertiv supports you in improving your uptime with a full range of innovative Liebert uninterruptible power supplies (UPS) and future-proof, integrated UPS systems, that will cover the backup power needs of your IT infrastructure, from small computer rooms at the network edge to enterprise and hyperscale data centers. Discover the best uninterruptible supplies to protect your application.

Vertiv™ EDGE UPS (750-3000VA)

Features and Benefits

- Highly efficient: maximize power to IT loads, realize lifetime energy savings
- Wide range of form factors and flexible installation options
- Advanced battery protection and runtime optimization features
- Hot-swappable internal batteries – less downtime
- Withstands higher operating temperatures
- Low noise
- Remote monitoring and management capabilities



Vertiv™ EDGE Lithium-Ion UPS (1500-3000VA 230V)

Features and Benefits

- Up to 3x longer battery life than traditional VRLA battery
- Smaller & Lighter weight of UPS unit
- Higher battery power density enable more runtime
- Faster battery recharge
- Environmentally Friendly
- Reduce total cost of ownership
- 5-year standard warranty on UPS & Li-ion battery



Vertiv™ Liebert® GXT RT+ (1000-3000VA)

Features and Benefits

- Available in 1-1.5-2-3 kVA ratings
- High output power factor (PF=0.9)
- Rack / tower design allows for flexible installations
- User-friendly liquid crystal display (LCD)
- High efficiency ECO mode
- Compact dimensions (2Us height) including batteries
- Integrated solution with batteries and electronics
- External battery cabinets (upto 6) for applications requiring long runtime
- Flexible communications through RS232 or USB ports
- Slot available for optional SNMP/web monitoring cards
- Rack mounting kit included



Vertiv™ Liebert® GXE (6000VA to 10000VA 230V)

Features and Benefits

- High output power factor (1.0)
- Full-color graphic LCD with gravity sensing orientation
- High efficiency in online mode (up to 94%)
- Even higher efficiency (up to 98%) in ECO mode
- Flexible rack/tower design, with rack mount kit included
- Extended runtime with up to 4 External Battery Cabinets (EBC)
- Hot-swappable user replaceable internal UPS batteries
- Remote management capability with optional Vertiv™ Liebert® Intellislot™
- IS-UNITY network management cards
- Wide input frequency operation (40-70 Hz) without any power derating
- Automatic internal bypass
- Free UPS management software
- Fast recharge time (3 hours @ 90%)



Vertiv™ Liebert® APM™ (18 to 90kW, 30 to 150kVA, 50 to 600kW)

Features and Benefits

- High efficiency rating of up to 96% in true online double conversion mode
- FlexPower Technology: Allows the configuration of a completely redundant power system, sized to match the capacity of the protected equipment
- Parallel technology allowing maximum system capacity of up to 600kW
- Internal or external, scalable modular battery configuration to suit power scalability
- Flexible battery configuration: 30 to 40 battery blocks per string



Vertiv™ Liebert® APM Plus (50-500kW)

Features and Benefits

- Remarkable double conversion efficiency - up to 97%
- Eco mode efficiency - >99%
- Flat efficiency curve
- High power density
- Fit for the row or room applications
- Modular and scalable
- Hot-swappable power modules & bypass module
- Distributed module control system
- Unitary output power factor and symmetrical power factor diagram
- Reliability boosters - Robust air channels, PCBs embedded with conformal coating
- Integrated parallel and load bus synchronization
- Intelligent paralleling function
- User-friendly 9-inch LCD touch screen display
- Supports UPS self-capacity test without load banks
- Tolerates higher ambient temperatures up to 50 °C with auto-derating



Vertiv™ Liebert® EXM2 (100kVA to 250kVA)

Features and Benefits

- Guarantees Maximum Energy Savings
- Further Maximizes Energy Savings
- Compact Footprint
- Increases Flexibility
- Guarantees Faster Battery Recharging
- Guarantees Wider Battery selection and Lowers Installation Costs
- Increases Adaptability and Lowers Cooling Costs
- Fully Compatible with Critical IT and Non-IT loads
- Achieves Maximum Capacity up to 1.5 MW
- Guarantees More User Friendly HMI and Leaner Spare Parts Management



Vertiv™ Liebert® EXS (10kVA to 80kVA)

Features and Benefits

- Output power factor up to 1
- Double conversion efficiency up to 96.2%
- ECO mode efficiency up to 99.3%
- Compact footprint with multiple internal runtime configurations
- Available in 3/3 and 3/1 versions (10-20kVA)
- Integrated maintenance bypass
- Integrated input and output breakers/switches
- Parallel capability for capacity and redundancy
- Lithium-ion battery compatible



Vertiv™ Liebert® GXT5 (700VA to 3kVA; 5kVA to 10kVA; 16 & 20kVA)

Features and Benefits

- Hassle-free management of multi-site rollouts
- Frees up time-strapped IT staff by managing and tracking UPS health, maintenance and service
- Reduces the worry of critical equipment downtime
- Ensures rapid recovery in the event of failure (within 24-48 hours)
- Frees you from the responsibility of handling and documenting the disposal of legacy UPS and batteries



Vertiv™ Liebert® ITA2 (5kVA to 40kVA)

Features and Benefits

- Eco-Mode provides a superlative efficiency of up to 99%
- Programmable output outlets/terminals with cascade protection to protect key devices during heavy load
- Integrated Ethernet port with HTTP protocol compatibility & streamlined remote monitoring
- Robust structure with cutting edge channelized airflow design Dust and moisture resistant
- Suitable for long back-up up to hours
- Parallelable up to 4+0
- Wide input voltage range, making it immune to grid interference
- Compliance with seismic conduction & vehicle carrying test



Vertiv™ Liebert® GXT5 Lithium-Ion UPS (1000VA to 3000VA)

Features and Benefits

- Hassle-free management of multi-site rollouts
- Frees up time-strapped IT staff by managing and tracking UPS health, maintenance and service
- Reduces the worry of critical equipment downtime
- Ensures rapid recovery in the event of failure (within 24-48 hours)
- Frees you from the responsibility of handling and documenting the disposal of legacy UPS and batteries



Vertiv™ Liebert® EXL™ (300 to 1200kVA)

Features and Benefits

- Efficient, High-Density Design and Operation
- Flexible Configurations and Design
- Intuitive, Intelligent Operation
- Designed for Easy Service and Maintenance
- Proactive remote service delivery
- Transformer-free topology with up to 97% efficiency in double conversion mode.



Vertiv™ Liebert® Trinegy Cube (200kW to 3.4MW)

Features and Benefits

Efficiency

- Adoption of a three-level NPC2 topology for both rectifier and inverter

Availability

- Predictive maintenance
- Event analysis, waveform capturing and harmonic spectrum analyses
- Data logging
- Vertiv™ LIFETM Services remote diagnostic and preventive monitoring embedded in the UPS

Capacity & Installation Flexibility

- Configurable in various layouts
- Simplified cable routing with unlimited input / output power connection availability
- Increased energy density
- Single unit configuration up to 3.4 MW

Smart Capacity

- I/O Box and cores rated to operate continuously up to 55°C and capable of providing increased performance down to 20°C
- Maximum input current of the UPS adjustable to meet specific protection rating requirements.
- Safe capacity test capability



Vertiv™ Liebert® APT

Features and Benefits

- The UPS and switchgear connect by copper bar, simplify the field cable engineering and realize the fast deployment of the power supply system in the data center.
- Prefabrication of secondary connection line in the system in the factory to realize fast deployment of intelligent system in data center.
- In the whole life cycle of the data center, only one equipment vendor is matched, and the communication efficiency is high.
- Built-in PTMS power chain intelligent management system, centralized and unified monitoring and management, real-time grasp of the system operation status.
- Optimize the system from multi-dimension of electrical system, manufacturing and field construction, simplify the structure and improve the reliability of the system.
- According to different requirements of data center construction, Compatible with power frequency, high frequency and modular UPS.
- UPS output system can be customized according to actual needs
- The system adopts uniform appearance design, which is more ornamental.
- Compact design with space saving up to 30%



Power Distribution

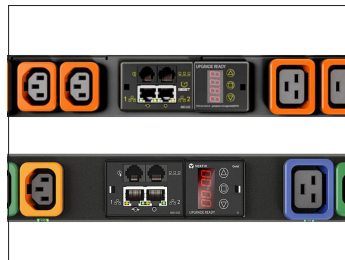
Increasing rack power density both in the data center and at the network edge means that reliable power distribution is crucial. Our innovative power distribution units and rack PDUs not only maintain power, but they also enable us to support you in any challenges your IT infrastructure might face. From basic PDUs, to monitored and switched rack power distribution units, to locking receptacles, Vertiv's solutions will offer the power distribution you need, as well as remote monitoring and management of your assets' power usage, so you can rest assured everything is running at peak performance.



Vertiv™ Geist® Basic Rack PDU

Features and Benefits

- Reliable rack power distribution
- Every unit is 100% tested for reliability and functionality
- Available in vertical and horizontal rackmount form factors.
- Flexibility to meet a broad range of requirements, with a variety of electrical and receptacle configurations available.
- Standard three-year warranty, upgraded to five years with product registration.



Vertiv™ Geist® Monitored Rack PDU

Features and Benefits

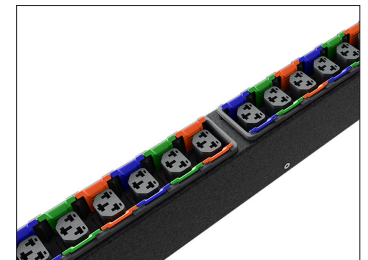
- Reliable power distribution with local and remote power monitoring options offer quick access to critical power usage information to evaluate energy usage trends and maximize uptime.
- Upgrade your hot-swappable monitoring device on the fly to leverage new technologies and accommodate changing business needs without having to replace entire power strips
- Every unit is 100% tested for reliability and functionality to ensure units function as designed.
- Standard three-year warranty, upgraded to five years with product registration.



Vertiv™ Geist® Metered Rack PDU

Features and Benefits

- Avoid accidental overloads when deploying or moving critical server equipment with instant access to power consumption metrics on the local LED digital display.
- Available in vertical and horizontal rackmount form factors.
- Every unit is 100% tested for reliability and functionality to ensure units function as designed.
- Standard three-year warranty, upgraded to five years with product registration.



Vertiv™ Geist® Combination Outlet C13/ C19

Features and Benefits

- Combination Outlet C13 / C19 is a 2-in-1 receptacle functioning as both an IEC C13 and C19 providing flexibility to connect C14 and C20 plugs in the same outlet
- Select the appropriate power configuration with confidence that the rPDU will have the right
- combination of outlets available no matter what equipment is.
- For ultimate rack power flexibility, select a Vertiv Geist UPDU, Universal Power Distribution Unit, with the Combination Outlet C13 / C19 to accommodate all initial deployment needs and any future equipment adds, moves, or changes.



Vertiv™ Powerbar iMPB

Features and Benefits

- Modular design with IP2X certified open-face track
- Extendable segments in increments ranging from 0.6 to 4 meters
- Capacities that range from 160 to 1000 amps
- Rigid aluminium busway track chassis
- Easy-to-change, hot-swappable tap-off boxes
- Busway track rated for 100% continuous current
- Interrupt capacity rating up of 10 to 50 kA
- Tap-off boxes with mechanical and electrical interlocks that utilize a ground-first, break-last safety feature
- Monitoring options for electrical oversight



Vertiv™ Geist® Rack Transfer Switch

Features and Benefits

- Automatic detection of power loss
- Reliable power switching
- Upgradable Technology
- Enhanced Intelligence
- Automatic Power loss detection
- Predict overloads with real-time power usage metrics
- Supports out of phase transfers
- <4-8ms Transfer Speeds
- Easy to use Front Panel Interface
- Combination Outlet C13/C19



Vertiv™ Liebert® RXA

Features and Benefits

- Reliable uninterrupted power distribution for your IT infrastructure
- High power density:
 - 400 Amps 84 Poles in 0.19 m2
 - 800 Amps 168 Poles in 0.38 m2
- Available in two ratings: 250 Amps or 400 Amps
- Flexible and scalable panel board, accepts 1, 2, 3 or 4 Poles branch circuit breakers, up to 84 Poles of available space
- Hot-swappable panel board system: replace or add a branch circuit in less than 20 seconds while other branches remain live
- Intelligent oversight with Liebert DPM monitoring system



Vertiv™ Liebert® SPM 1.0

Server Power Management Power Distribution Unit

Key Benefits

- Intelligent
- Flexible
- High Reliability

Key Features

- Aesthetic and effective structure
- Monitoring system
- Advanced calculation and control system
- Hot swappable
- Anti-disturbance solution





Thermal Management

Your mission-critical facilities need the very best in precision cooling, and we deliver with the industry's most advanced equipment and controls, low operating costs and unparalleled expertise. Get efficient and reliable heat management and humidity control solutions geared to your specific size, location and business goals.

Vertiv™ Liebert® PCW

Features:

High Efficiency

- With optimized aerodynamic design (minimum internal pressure drops), and the new EC Fan 2.0, Vertiv™ Liebert® PCW can perfectly match the cooling needs of the server with minimum power consumption. Liebert® PCW delivers optimum energy efficiency and 70% saving when compared to standard market solution with EC fans.



EC Fan

- The unit is fitted with one (two, three or four) direct-driven, high efficient, single inlet, backward curved centrifugal 'plug' type innovating EC fan(s). The fan(s) have an impeller with corrosion resistant curved blades made of fibreglass plastic, which dramatically reduce the noise level and increases the unit efficiency.

Intelligent Controller with HMI Display

- The 9 inch HMI touch screen is a standard offering for 250 kW model and it is also available for other models on request.

Aeraulic Design Efficiency

- Specially designed cooling cabinets for lower air pressure drop resulting in a higher NSEER. A unique inner aerodynamic architecture - from the coil angle to the electrical panel - achieving an outstanding competitive advantage and state-of-the-art efficiency.

Easy Installation & Maintenance

- Liebert PCW simplifies installation & maintenance for operational efficiency. Complete frontal access of cooling coil, filters, user friendly electrical connection, and furthermore, to simply access the fans during installation and replacement. The Liebert PCW maintenance kit facilitates servicing, reducing repair time, and possible downtime.

Vertiv™ Liebert® DM

Features:

User Friendly and Maintenance Free:

- 24/7 operation capable
- Ultra wide input voltage range: multiple power protection functions
- Environment adaptability: adoption to outdoor temperature while meeting cooling requirements
- Adaptive to heat dissipation of the main equipment



Intelligent Controller:

- 7-inch HMI Colourscreen & easy to use interface
- 3 level password protection to prevent unauthorized operation
- Graphical representation of return air temperature & relative humidity display in real time
- Email and SMS notification (thru Vertiv™ Liebert® RDU™) for remote monitoring functions
- Store up to 999 alarm history

Vertiv™ Liebert® PEX3 and PEX4

Both PEX3 and PEX4 Features:

- Microchannel evaporator coil
- Electronic expansion valve
- R410A Refrigerant
- Options for 1 and 2 stage electric heating
- Options for infrared and electrode humidification
- Intelligent controller, for precise temperature & humidity control
- Inverter scroll compressor and high return air capability (PEX4 feature)



Vertiv™ Liebert® CRV4

Features

Evaporator Coil Design

- The finned tube evaporator with high heat dissipation efficiency is used. R&D has produced evaporator designed with increased in efficiency by ensuring that the refrigerant is distributed evenly in each loop.



Variable Capacity Brushless DC Inverter Compressor

- DC inverter compressor technology provides infinite variable capacity modulation between 30% - 100% to ensure precise repose to dynamic changing cooling demand.
- Improved reliability by reducing compressor cycling and component wear.
- Environment-friendly R410A refrigerant.

Flexible Fan Operation

- The EC fan speed is automatically regulated by the CRV4 smart controller.
- High efficiency EC fans saves energy and hot swappable design allows replacement while the unit is running.

Electronic Expansion Valve (EEV)

- Allows for integrated and optimal variable capacity control.
- Maintain constant superheat & dehumidification assistance.

Vertiv™ Liebert® Custom Air Handling Systems

Features:

Revenue Enhancement

- Rapid deployment for speed to market
- Minimized use of white space Visibility into multi-tenant SLAs



Cost reduction

- Energy and water efficiency Lower-cost deployment
- Higher productivity and less maintenance

Risk management

- Modular redundancy
- Automated controls protection routines
- Operational security
- Highly experienced engineering and implementation team

Vertiv™ Liebert® VIC

Features:

Liebert® VIC Liquid Immersion Cooling Enables You to:

- Scale easily, cost-effectively — and limitlessly
- Increase cooling capacity up to 100 kW with warm water at 35 °C (95 °F)
- Achieve PUE approximately 1.05



Liebert VIC solution delivers optimum results with the help of ElectroSafe Dielectric Liquid Coolants:

- An odorless, non-toxic, single phase coolant that is both electrically and chemically inert
- Does not need to be replaced over the life of the data center
- National Fire Prevention Association (NFPA) 704 Diamond rates ElectroSafe as a 0-1-0 substance. This means that it poses no health hazard, has a high flash point, and is stable even under fire exposure conditions

Vertiv™ Liebert® LPC

Features:

- The brushless DC motor is inherently more efficient than an AC motor and is designed to be speed modulated.
- Constant modulation according to sensible load helps tight control on temp & RH; also more energy efficient
- Necessary for integrated and optimal control of the variable capacity.
- Maintain constant superheat & additional help in dehumidification
- Liebert LPC Constant Temperature and Relative Humidity (temperature precision is up to $\pm 0.5C$, and humidity precision is up to $\pm 2\%RH$)
- Power failure auto-restoration function and high/low voltage protection function.
- Maximum 3-5 remote sensor can be controlled
- EC fans are highly efficient, maintenance-free and have an easy AUTOMATIC speed control.
- The fan modulates together with the compressor to have greater efficiency and control flexibility



Vertiv™ Liebert® EFC

Features:

Integrated Chilled Water Coil or Direct Expansion System:

- These technologies ensure the unit's operation even in climates characterized by extreme humidity levels or severe temperature peaks



- **Advanced Vertiv ICOM™ Control:** Ensures high level management of the units to work together as a single system, thus optimizing room temperature and airflow. Furthermore, it features a new 7" touch screen display for quicker and easier data readability

- **SmartAisle™ Control Logic:** Optimizes internal air volumes and temperature according to specific server needs, ensuring that not a single Watt is wasted

- **Eurovent Certified Heat Exchanger:** Eurovent certification guarantees that Liebert EFC heat exchangers undergo independent testing, thus delivering rating accuracy and enhancing the unit's reliability

Vertiv™ Liebert® SRC-G

Features

The micro-processing controller has the following features:

- It can monitor and display the operation status of Liebert SRC unit to maintain the environment within the range of setpoints.
- Equipped with a 128x64 dot graphics color screen with white back-light with a user-friendly interface.
- Provides a two-level password protection to prevent unauthorized operation.
- Provides multiple functions, including self-recovery upon power failure, high & low voltage protection, phase loss protection and protection against phase-reversal.
- Accurately record the run-time of important components through menu operation.
- Stores up to 99 historical alarm records.
- Configured with an RS485, using MODBUS-RTU communication protocol.





DC Power Systems

Constant availability and maximum energy efficiency are no longer ideals for telecom operators and communication network owners. They are prerequisites. Vertiv's extensive range of holistic DC Power Systems, including the NetSure DC Power technology platform, delivers the most innovative and dependable network-power applications, with an unparalleled breadth of intelligently engineered DC power, distribution, control and monitoring systems. See them for yourself and let's proactively future-proof your critical infrastructure.

Vertiv™ eBase 2.0

Features:

- Energy Efficient
- Precision Air conditioning:
- Reliable & Compact Power Supply
- Intelligent Monitoring
- High Ingress Protection
- Aesthetically Appealing Design
- Optional 10.4" LCD Touchscreen Panel



Vertiv™ Netsure™ HVT F02

Features:

- Higher power density and small footprint
- Safe and reliable with alarms for insulation failure and grounding faults
- Local monitoring and control via 7-inch touchscreen color display
- Real time remote monitoring via TCP/IP, SNMP and major web browsers
- Specialized parallel design for capacity expansion



Vertiv™ Netsure™ 531

Features:

- Front operation, which is convenient to install and maintain.
- System cabling : up inlet, up outlet ; lower inlet, lower outlet.
- Small size, light weight. Wallmounted installation mode minimizes the cost.
- High efficiency rectifier efficiency up to 96%, system efficiency up to 95%.
- Wide input voltage range (85~300Vac), strong ability in adapting power grid.
- High-efficiency rectifier working temperature range: -40~+80 (-40~+55 , full load output; >55, derating output).
- Energy-saving sleep modefunction, which reduces electricity consumption.
- Hot pluggable, easy and fast online maintenance.
- Perfect battery management, which prolongs battery life.
- Multiple communication ports (such as RS232 and dry contacts), which enables flexible networking and remote monitoring



Vertiv™ Netsure™ 7100 Series

Features:

- **Easily Adaptable:** Tolerates a wide range of input voltage, i.e. from 85 to 305 VAC
- **High Efficiency:** - 96.3% efficient eSure rectifier delivers optimized total cost of ownership
- **ECO Mode:** Embedded with an advanced energy optimization technique that enables significant savings, even at low load operation
- **Advanced Battery Management:** Automatic battery tests in conjunction with battery midpoint monitoring (optional) ensures early detection of battery problems
- **Multiple Communication Interface:** Built-in communication ports such as RS 232, RS 485, USB, and Ethernet enable flexible remote controlling & monitoring



Vertiv™ Netsure™ IPE Outdoor DC Power System

Features:

- Fanless cooling eliminates maintenance and results in silent operation
- Wide temperature operating range from -40°C to +75°C / -40°F to 167°F
- Compliant with global industry standards
- Wall and pole mountable in flag or flat position
- Ideal for rapid deployment in urban, rural, or protected public areas



Vertiv™ eSure™ Rectifier R48-1000 C Series

Features:

- Convection cooling without noise - for silent operation in residential and office locations
- IP 55 and IP 65 high level protection - for harsh environments
- High efficiency, above 95% - reduces power consumption for lower operating costs
- Wide input AC or DC voltage range to operate in a variety of applications
- Wide temperature operating range -40°C to +75°C (-40°F to 167°F) to meet the harshest environments
- Compliant with global standards - delivers quality, performance and reliability, no matter what the application or location demands
- DSP (Digital Signaling Processor) - means fewer components, optimized operation and active load sharing for increased reliability



Vertiv™ eSure™ Rectifier R48-3500E4

Features:

- Save space with highest density (50.2 W/inch³) in DC power industry
- Lower operating cost in all load conditions with ultra-high 98% efficient rectifiers
- Benefit from instant energy savings on installed base with backward compatible rectifiers;
- easily replace R48-3500E3 rectifiers with 98% efficient R48-3500E4
- Minimize investment and optimize power efficiency at any load condition with ECO mode
- Monitor savings on your investment with the Efficiency Tracker tool built into the NCU controller



Vertiv™ Netsure™ Inverter Series

Features:

- Market leading inverter power density (24 VA/in³)
- Same battery bank for both AC and DC loads
- Long battery back up for both AC and DC loads
- Zero transfer time from AC mains to battery sources



Vertiv™ Netsure™ 701

Features:

- Provides up to 77 kW per system, can be expanded up to 154 kW.
- Can be installed against a wall.
- Front access and top cabling design for installation and maintenance.
- Cost effectively, allows for easy expansion, local/remote control and supervision via advanced controller.
- Rectifier working temperature range from -40°C to 75°C, strong ability to work in high temperate environment.
- Rectifier with digital signal processing control and comprehensive soft-switch technology, raising the rated efficiency up to 96%.
- Hot pluggable rectifier module, provide ease and fast online maintenance.
- Provides lightning protection design on both AC side and DC side.
- Provides comprehensive fault alarm, fault protection function.
- Perfect battery management, which prolongs battery life.
- Easy asset management with rectifier ID number identification function.



Vertiv™ Netsure™ 731

Features:

- The rectifier uses the active Power Factor Correction (PFC) technology and the power factor increases up to 0.99.
- The power system has a wide AC input voltage: 85Vac~300Vac.
- The rectifier uses soft switching technology, raising the efficiency above 95.5%.
- The rectifier has ultra-low radiation. With advanced EMC design, the rectifier meets international standards such as CE NEBS and YD/T983.
- Effective battery management, includes the management functions such as BLVD, temperature compensation, auto voltage regulation, stepless current limiting, battery capacity calculation and on-line battery test among others.
- Provides multiple, integrated communication ports (such as RS232, Ethernet and dry contacts), that enable flexible networking and remote monitoring.
- Integrated lightning protection at both AC side as well as DC side.



Vertiv™ Netsure™ 801

Features:

- The power system keeps in normal operation under the voltage ranging from 260Vac to 530Vac and withstands an extreme voltage input of 600Vac
- Network monitoring: Remote monitoring is performed in real time through network interfaces, modems, and RS232 interfaces
- Digital active current sharing: stable current equalization. The unbalance of load sharing is less than 1%. The rectifier module can work steadily independent from monitoring units and automatically equalize currents
- Safety and reliability: full surge protection design for AC, DC, and signals
- Damage-free hot swap of rectifier modules and monitoring modules and quick and easy online maintenance.
- Full front access operation and unlimited overhead and underground cabling
- Battery pole reversal protection: Protect against module explosion in case of battery pole reversal
- Withstand transient overvoltage generated by the generator startup with no strict requirements on generator output
- Gradual increase in output current: The output current can be set to gradually increase. This minimizes the shock to loads and batteries and prolongs service life of the batteries





Services

Vertiv ensures continuous uptime of your critical operations so you can perform at your peak and maximize your resources. Whether you are in a data center, communications facility, government agency, or industrial plant, we collaborate with you every step of the way.



Spare Parts & Parts Management

Having the parts you need on site and at the latest revision level reduces unplanned downtime and keeps your systems up and running.



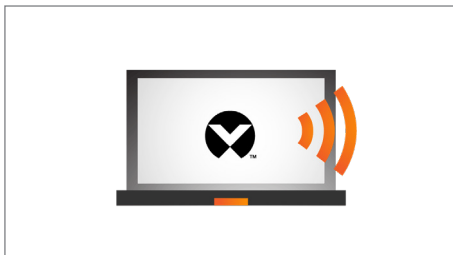
Preventive Maintenance

Design and implement a maintenance strategy that will improve your facility's availability and performance.



Performance Optimization Services

The life of your IT critical equipment can be shorter than design life if you do not regularly optimize the equipment and your data centre. With that in mind, we designed a holistic Performance Services offering, to enable you to optimize the life of your critical equipment and the life of your data centre.



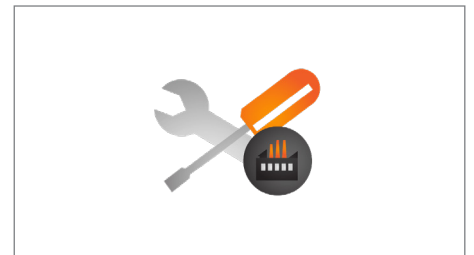
Remote Services

Ensure healthy critical systems by relying on domain experts who use advanced monitoring to capture and analyze your system data, and turn it into action.



Project & Commissioning Services

Maximize your investments, prevent delays, and avoid rework with effective project planning and execution.



Preventive Maintenance for Industrial

Have regular maintenance to ensure that your industrial systems are performing at optimal levels.



Vertiv™ Powerbar iMPB

Introducing Vertiv's new IEC certified intelligent Vertiv™ Powerbar iMPB - now available with a current rating of up to 1000A. Ideal for dynamic data center environments, the modular Vertiv™ Powerbar iMPB system allows businesses to cost-effectively optimize and adapt power distribution infrastructure over time, maximizing availability with continuous power delivery to critical loads. User friendly tap-off boxes can be placed anywhere along the busway for easy integration into any data center layout.

Features:

- Modular design with IP2X certified open-face track
- Extendable segments in increments ranging from 0.6 to 4 meters
- Capacities that range from 160 to 1000 amps
- Rigid aluminium busway track chassis
- Easy-to-change, hot-swappable tap-off boxes
- Busway track rated for 100% continuous current
- Interrupt capacity rating up of 10 to 50 kA
- Tap-off boxes with mechanical and electrical interlocks that utilize a ground-first, break-last safety feature
- Monitoring options for electrical oversight

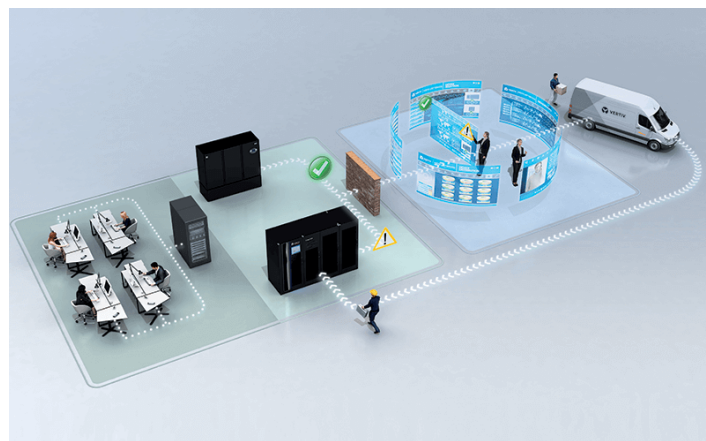
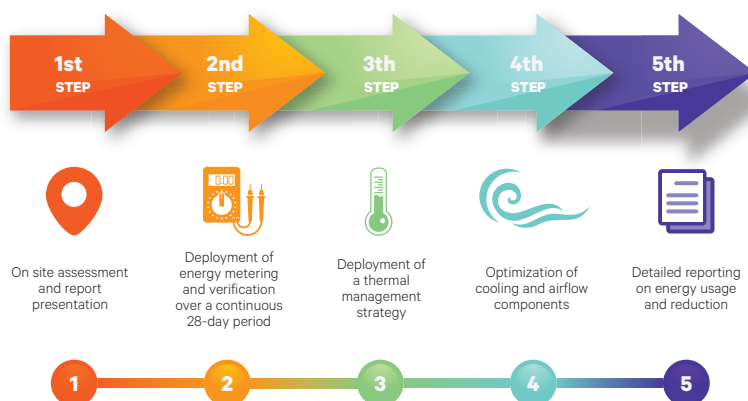
Vertiv™ EnerSav

Vertiv EnerSav optimization program is a low-risk, economical, and efficient solution for chiller plants and data centers or server rooms and is made up of complementary retrofittable equipment that enhances the day-to-day operational capacities while reducing ongoing operational costs. After the initial on-site consultation, a detailed gap analysis report will be presented detailing current kWh consumption and highlighting the potential energy savings or standard capacity as a business case for optimization, including return on investment calculations.

Benefits

Reduced Costs Significant energy consumption reduction
Improved Infrastructure Better performance and extended life
Advanced Monitoring Automated Thermal Management
Faster ROI Within 36 months

The Process



Vertiv™ Life™ Services

LIFE™ Services provides continuous monitoring and data analysis by remote system engineers that quickly, accurately, and safely restore equipment to its proper operating condition.

Features:

- **Remote monitoring** of 150 unique parameters happens 24/7 to allow for early detection of trends and operating anomalies that may lead to critical failures if not addressed
- **Data analysis** by specially trained remote system engineers provides interpretation of critical system alarms and status messages to better understand potential data center impact
- **Remote problem diagnosis**, using the extensive data collected, determines the cause of alarm conditions, identifies potential future problems, and provides information on performance trends
- **Rapid incident response** happens due to near-instant notification of issues followed by concurrent problem diagnosis and dispatching of an informed technician
- **Detailed reports** contain a summary of all alarm events for the entire monitoring period, demonstrating that your critical systems are operating successfully and have continuous remote monitoring



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