VERTIV.

Product brochure

Vertiv™ Trinergy™ UPS

Vertiv™ Trinergy™ overview and benefits at a glance

Elevating performance, resilience, reliability and efficiency for your power needs. Vertiv™ Trinergy™ is the next-gen system built on a history of exceeding Tier IV data center power chain availability and over 40 years of technical innovation and global field-proven experience.

- **Innovative UPS control features for AI loads:** Input power smoothing and battery shield
- **Best-in-class modular system** for maximum flexibility from room to pre-fabricated deployment
- **Service empowered by Vertiv™ Next Predict** with an AI-powered, data-driven approach built for today's high-demand infrastructure
- **More power in a single block**, compared to existing products, to support high density applications, **as AI or HP. Up to 40% space savings**, compared to our offering
- **A power center ready to integrate different energy and back up power sources,** including lithium-ion and nickel-zinc
- **Hot and easy serviceability** for no interruption, even during maintenance or power upgrades
- **The ultimate optimized high-power solution** for global standards and easy installation
- Designed, manufactured, tested and available **across the globe**
- **415V 4 wire distribution** now available for 1500 kW, 1600 kW and 2000kW models for **higher power density and efficiency**
- **Vertiv's most reliable, resilient and efficient UPS in its product class** for unparalleled reliability and resilience
- **Skid-mount and containerized power solutions** featuring Vertiv™ PowerNexus, combining Vertiv™ Trinergy™ UPS and Vertiv™ Switchgear
- **Built on 16 GW+ of Vertiv™ large power UPS** installed globally

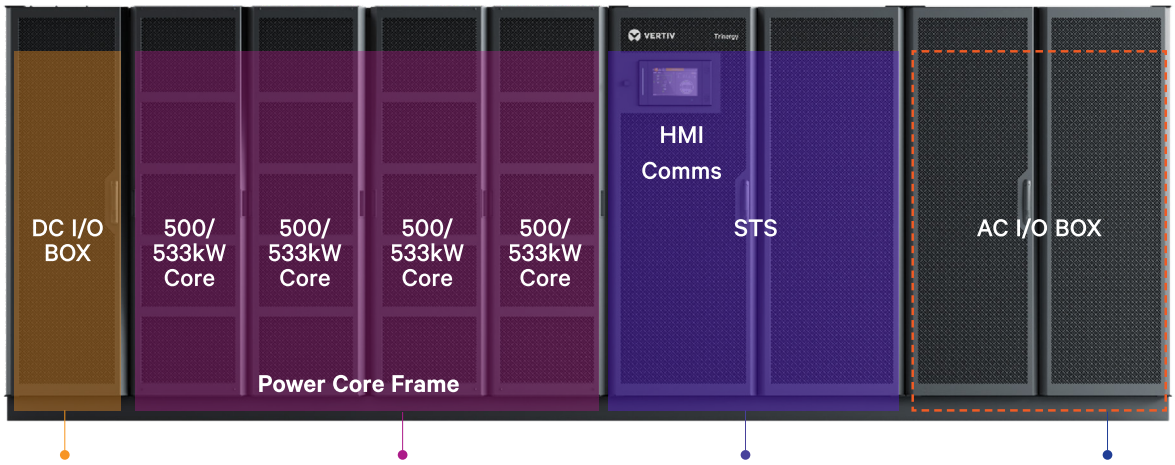
	Tier IV data center power-system	Vertiv™ Trinergy™
Availability	**99.9994%** *Source: Uptime Institute*	**99.9999998%** *Source:* • *Real measured UPS data* • *40 years of experience* • *15,000 monitored UPS*
Downtime	**8 hours in 10 years**	**30 seconds in 10 years**

Over four decades, advancements have improved reliability and reduced repair times. These gains stem from a strong foundation of innovation and expertise. Vertiv™ Trinergy™ builds on these achievements.

Discover **Vertiv™ Trinergy™** and request a demo

Modular design to meet the needs of each application

Vertiv™ Trinergy™ scales the concept of modularity up to all levels of the UPS architecture. Building blocks can be combined to fit different deplyoment types.



Dedicated DC I/O cabinet

The DC power connections are routed through a dedicated cabinet, featuring top and bottom power connections and an integrated DC ground fault detection option.

500/533kW UPS cores

Each core is independent and includes the components of an online UPS: inverter, rectifier and booster/charger.

It features one global design with options for 400V and 480V, compliant with both CE and UL standards.

Static switch cabinet

The bypass static switch is housed in a dedicated cabinet, offering an integrated backfeed disconnect option, power terminals for close-coupled applications, and support for single or dual input configurations. It follows a global design for 400V and 480V.

AC I/O cabinet

AC power connections are routed through a dedicated cabinet:

- **Top** and **bottom** power connection
- **Cable** or **flange** connection
- This cabinet can be adapted or removed for close-coupled applications

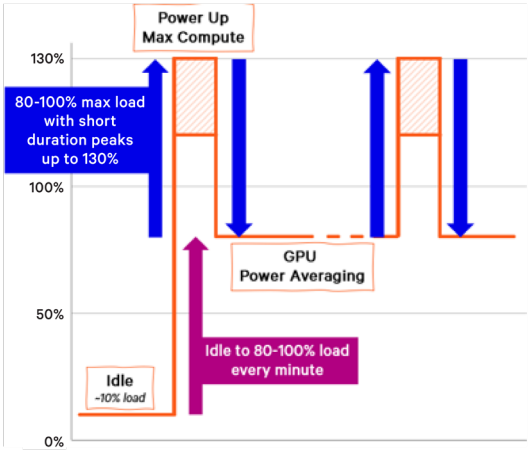
Vertiv™ PowerNexus: integrated power for AI data centers

The Vertiv™ Trinergy™ STS cabinet redefines power distribution in compact environments. Featuring power terminals, it minimizes footprint and maximizes power density, ideal for skid, container, and close-coupled applications. With no need for an AC I/O box, the switchgear connects directly to the STS cabinet terminals, simplifying installation. Moreover, in skid/container setups, a dedicated junction cabinet replaces the AC I/O box, streamlining power connections. Vertiv Trinergy seamlessly integrates with **Vertiv™ PowerNexus** and power skid solutions, offering modular design for maximum power density in any deployment scenario.

AI workload power management for large ups systems

As AI and HPC workloads continue to drive higher rack densities and rapidly fluctuating power demand, data center power infrastructure must adapt to maintain reliability, efficiency, and grid stability. Vertiv's AI-ready UPS solutions are designed to support dynamic AI loads while protecting critical power systems and maximizing infrastructure utilization.

Learn more in our technote:
Evaluating the performance of Vertiv™ large UPS systems with AI workloads



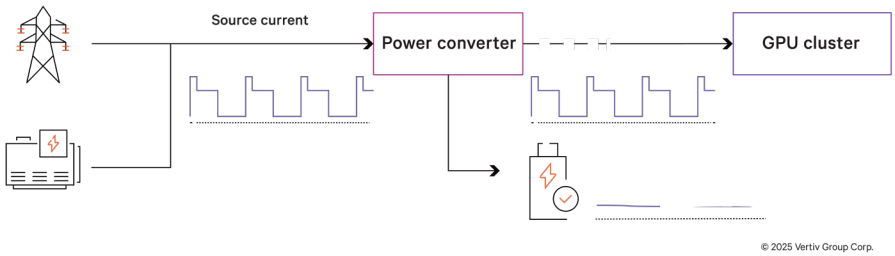
Advanced UPS control for AI workloads

Battery shield

AI workloads can create frequent short-duration load fluctuations that may trigger repeated battery micro-discharges. Over time, this can accelerate battery aging, reduce available backup capacity, and increase maintenance requirements.

Advanced UPS control features whitepaper

Battery Shield dynamically manages internal UPS energy reserves to absorb rapid load variations without unnecessarily cycling the batteries.



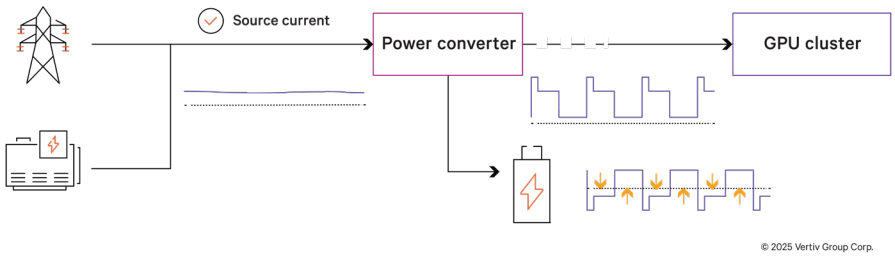
Key benefits

- Extends battery life by reducing micro-cycling
- Preserves backup energy availability for actual outage events
- Reduces battery maintenance and replacement needs
- Improves resilience during highly dynamic AI load conditions

Input Power Smoothing (IPS)

AI applications can generate fast and dynamic power fluctuation changes that propagate upstream to generators and the electrical grid. These fluctuations can create challenges, particularly in facilities with generator support or constrained utility connections.

Input Power Smoothing (IPS) uses the UPS energy storage system to compensate AI load variability, maintaining a controlled and predictable power draw from the upstream power source.



Key benefits

- Delivers a stable power profile to the grid and generators
- Reduces stress on upstream electrical infrastructure
- Enhances generator compatibility
- Supports compliance with utility and ramp limitations
- Configurable to match site-specific operating requirements

Fault ride through for large power UPS

What is fault ride through and why it matters

Hyperscale data centers have evolved into **gigawatt-scale loads**, making them active participants in grid dynamics, and therefore must remain stable during disturbances to avoid fault propagation on the grid.

During grid faults, the conventional datacenter behavior that consists on disconnecting the IT load and delaying the recovery can create additional instability at grid level.

Fault Ride Through (FRT) enables datacenters to:

- Remain connected during grid disturbances
- Limit their impact on the grid
- Rapidly restore power after fault clearance

Emerging TSO expectations

Transmission System Operators (TSO) worldwide are introducing new expectations for large electrical loads, reflecting their growing impact on system stability. While requirements vary by region, there is a clear convergence around a few key performance areas:

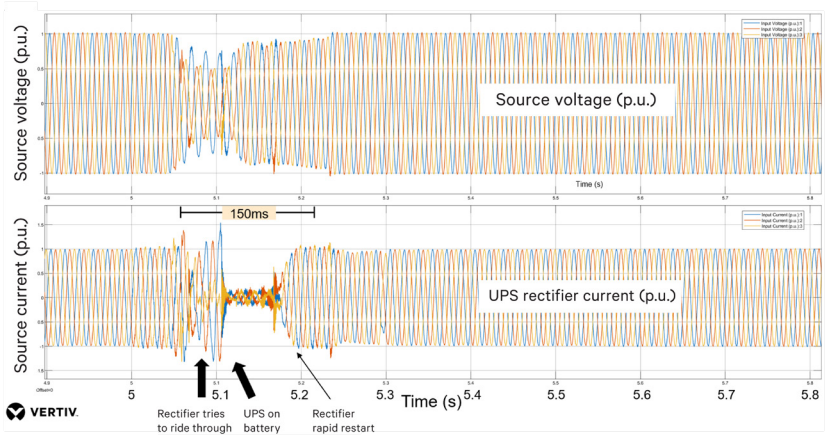
- **Voltage Ride Through (VRT):** Ability to remain connected during deep voltage dips
- **Controlled current behavior:** Limiting current during disturbances to maintain converter stability
- **Post Faut Active Power Recovery (PFAPR):** Rapid restoration of power demand
- **Frequency & dynamic stability:** Tolerance to frequency deviations, ROCOF, and phase angle jumps

With these requirements TSOs are expecting predictable, stable, and grid-supportive behavior from large datacenters.

Implications for UPS architecture and control

FRT requirements introduce a new paradigm. UPS systems must now combine **load protection with grid-aware behavior**, enabled through advanced control strategies and firmware.

- **Extended ride-through operation:** Maintaining grid connection over a wider voltage thresholds using controlled operation modes
- **Energy storage support:** Supporting the load during undervoltage events while still drawing controlled power from the grid
- **Dynamic current limitation:** Providing converter stability during faults without triggering disconnection
- **Fast Post-Fault Recovery (PFAPR):** Restoring grid power consumption within hundreds of milliseconds instead of seconds



Continuous-duty booster and continuous-duty static bypass switch

Vertiv™ Trinergy™ power center stands out in the market for its **innovative continuous-duty booster converter,** a feature that secures uninterrupted power supply even at full load indefinitely. This capability, made possible by advanced hardware design and control techniques, sets Vertiv Trinergy apart from traditional UPS systems. Its ability to directly connect to DC sources enables **seamless integration with alternative power solutions like fuel cells, enhancing reliability and flexibility.**

Complementing its booster converter is Vertiv Trinergy's solid-state static bypass switch, enabling seamless power transitions. Vertiv Trinergy's continuous-duty performance opens doors to various applications beyond traditional UPS systems. Some of its applications include:

- Long duration batteries integration
- Extended dynamic grid support & peak shaving
- Integration with renewables
- Integration with micro grid
- Fuel cells integration for backup or prime power
- Integration with distributed & alternative energy sources

Vertiv Trinergy is also well-suited for microgrid applications, offering reliable backup power in remote areas.

Reduced TCO

>97%

Double Conversion **Efficiency**

CO_2

950 tons

of CO_2 saved every year

Advanced control diagnostic, excellent operating efficiency, intelligent paralleling feature, minimum footprint and high energy density make Vertiv™ Trinergy™ the perfect UPS to deliver secure power to all mission critical applications, maximum energy saving and rapid return on investment.

Neutral Carbon Footprint

Vertiv Trinergy's new generation architecture has been designed to reduce energy and heat dissipation, consequently minimizing the demand and consumption of air conditioning systems.

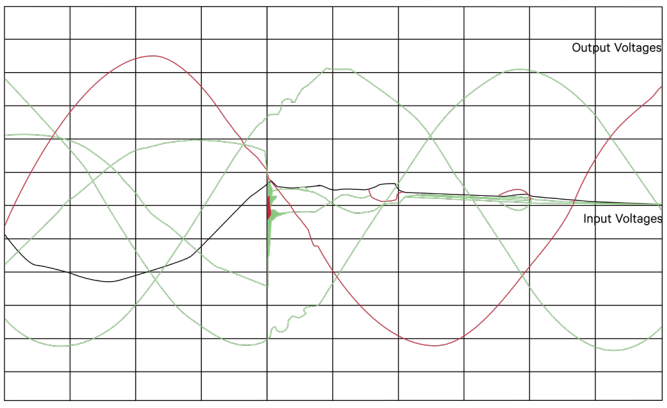
The combination of these factors, coupled with a double conversion efficiency of up to 97%, reduces CO_2 emissions to a minimum. This contributes to your customers' data centers being a step closer to the industry's environmental and efficiency compliance standards.

Waveform capture: enhancing power quality analysis

Waveform Capture is a diagnostic tool that records the electrical waveforms of voltage and current. This capability is needed to understand and analyze power quality issues at critical moments (such as during power disturbances or faults) and to mintain the reliability of the power supply system.

The main advantages of Waveform Capture in Vertiv™ Trinergy™ are:

- **Precise event analysis:** By capturing the waveforms of both voltage and current during irregularities, the exact nature and cause of the disturbance can be understood. This includes recording events during and after an anomaly occurs.
- **Troubleshooting support:** In the event of a failure, the stored waveform data provides valuable insight that can be used to troubleshoot issues, reducing the time required to restore normal operations.
- **Customizable data capture:** Users can tailor the feature to their needs by selecting specific time frames and choosing the channels relevant to their power monitoring requirements.



Improved efficiency

Vertiv™ Trinergy™ delivers an outstanding **double conversion efficiency of up to 97.4%,** consequently reducing operating costs and energy dissipation (kW) to a minimum. This significantly minimizes the consumption of the cooling system, providing an overall TCO reduction and rapid payback time.

Furthermore, through its intelligent ECO mode efficiency and the intelligent paralleling feature Vertiv Trinergy can optimize efficiency even at partial load achieving additional superior cost savings.

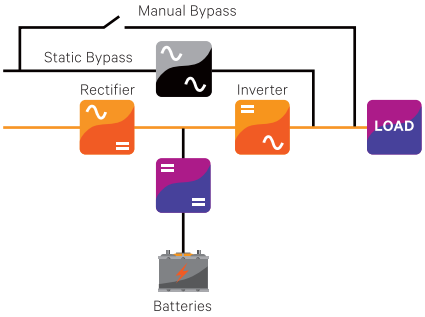
Vertiv Trinergy levels of efficiency and consequent electricity cost savings can be attributed to:

- Latest generation IGBT
- Adoption of a three-level NPC2 topology for both rectifier and inverter
- DC controlled fan speed
- Intelligent paralleling mode
- Advanced digital technology and fast transfer

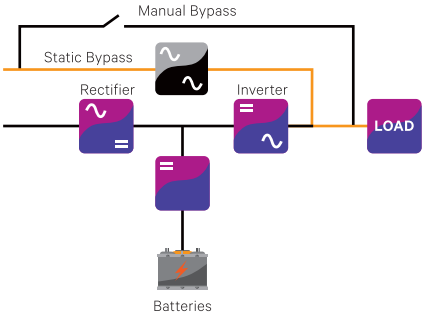
The seamless activation of Vertiv Trinergy's functioning modes offers the highest level of efficiency without compromising power quality and availability.

The dynamic online mode offers Class 1 output performance under most stringent conditions such as network faults (voltage variation, high/low impedance mains failures).

The unit is able to discriminate between various types of interferences and rapidly respond, while at the same time maintaining compatibility with downstream equipment such as servers, transformers, STS or mechanical loads.



Maximum Power Control (VFI)
Provides the highest level of power conditioning and protects the load from all electrical network disturbances.



Maximum Energy Saving (VFD)
Detects when conditioning is not required and allows the energy flow to passthrough he bypass line.

Learn more about the dynamic online mode in our white paper
“High efficiency modes of operation”

Vertiv's most reliable, resilient and efficient UPS in its product class

Datacenters face mounting pressures to secure unfailing uptime and reliability. Responding to these exigencies, Vertiv™ Trinergy™ UPS is intricately designed to meet and surpass the contemporary resilience benchmarks. This is not just a response to market trends and needs but is deeply rooted in the lessons learnt and end user necessities, reflecting a commitment to address and integrate user feedback into tangible enhancements.

Design reliability

At the core of the Vertiv Trinergy reliability is the application of Design Failure Mode and Effect Analysis (FMEA), a proactive metodology that meticulously identifies potential points of failure and mitigates them through strategic design enhancements.

This approach enables the development of certain product features that enhance the operational integrity and also offer substantial benefits to customers.

Verification & validation tests

For the verification and validation of Vertiv™ Trinergy™ 30 MW of prototypes have been built.

This approach enables the development of certain product features that enhance the operational integrity and also offer substantial benefits to customers.

Verification and validation tests are critical in securing that UPS systems adhere to stringent performance standards. Engineering Validation Tests (EVT) and Design Validation Tests (DVT) rigorously assessed and confirmed the product specifications.

Through this process, Vertiv Trinergy has been validated against a spectrum of operational conditions to establish its capability to perform reliably in real-world scenarios.

Additional tests have been performed to simulate critical conditions that a Vertiv Trinergy might encounter. Some of the additional tests performed are:

- **Structural tests** to verify seismic resilience and general durability
- **Debris protection testing** for environmental robustness
- **Voltage surge & sag tests** to ascertain electrical resilience
- **Highly accelerated life testing (HALT)** provides accelerated aging scenarios to foresee long-term reliability

Read our white paper:
Enabling uninterrupted power: design for reliability in UPS system

Watch video:
Demonstrating Vertiv Trinergy's reliablity in extreme hot and humid environments

Enhance your power reliability with distributed battery systems

Uninterrupted power supply is essential for maintaining the seamless operation of critical applications, especially in large-scale data centers. At Vertiv, we understand the pivotal role that a resilient UPS system plays in protecting your electronic equipment from power disruptions, blackouts, and voltage spikes. Our advanced distributed battery systems are designed to enhance the reliability and efficiency of your UPS systems, securing continuous power quality and availability.

Why choose distributed battery systems?

1. **Unmatched fault tolerance:** Distributed battery systems decentralize battery modules, allowing for effective fault isolation and management. This design allows that even if one module encounters an issue, the remaining modules continue to provide uninterrupted power.
2. **Scalability and flexibility:** Our distributed systems are easily scalable, enabling you to add more modules as your power needs grow.
3. **Maintenance efficiency:** With distributed battery systems, maintenance can be performed on individual modules without disrupting the overall system.
4. **Enhanced system availability:** Distributed battery systems provide continuous power supply, which is crucial for mission-critical applications. By reducing the likelihood of complete system outages, our systems enhance overall availability and reliability.

Compliant

- UL 1973
- UL 9540A tested
- UL 9540

Qualified for immediate use with most current and legacy three phase Vertiv™ Liebert® UPS systems.

Ready for

LIB

Lithium-ion batteries

Vertiv™ EnergyCore battery cabinet

The Vertiv™ EnergyCore is the first optimized battery cabinet designed by datacenter experts for data center users. The Vertiv EnergyCore system has successfully completed a UL 9540A fire test.

The Vertiv EnergyCore is engineered to provide safe, reliable, and cost effective energy that improves critical infrastructure performance over traditional valve-regulated lead-acid systems.

Not only do users enjoy the longer life, more cycles and fewer replacements of this system, they also benefit from its compact, smaller size and lower weight.

Reduce battery replacement cycles

VRLA	3-5 years
LIB	10-15 years

VRLA = valve regulated lead-acid
LIB = data center lithium-ion

Fewer facility disruptions
Lower total cost of ownership

Vertiv™ EnergyCore battery cabinet

Rely on integrated project and lifecycle UPS services for superior critical infrastructure protection

Offer continuity to your business activities with a service partner who stands by you throughout your critical equipment lifecycle. From the project phase with start-up and testing, to lifecycle maintenance contracts and operational support, Vertiv secures your solution performs optimally. Global presence & local resources With the broadest, most comprehensive service presence in the industry and more than 3,500 engineers dedicated to servicing the entire world, Vertiv secures that your business is always protected, and that service is available whenever needed 24 hours a day.

Vertiv™ Life™ Services

Vertiv™ Life™ Services provides continuous monitoring and data analysis by remote system engineers that quickly, accurately, and safely restore equipment to its proper operating condition. It connects critical systems with Vertiv engineers who continuously monitor and analyze real-time operating data to identify trends, predict behaviours, and respond immediately to out-of-norm conditions, either resolving issues remotely or dispatching a field engineer within minutes. The result is a connected service experience that leverages data and expertise to optimize equipment performance and maximize availability.

Vertiv™ Next Predict

Using AI-powered analytics, Vertiv™ Next Predict continuously monitors equipment condition and flags risks before they cause disruption. This insight fuels smarter maintenance schedules, reduces unnecessary site visits, and prioritizes uptime when it matters most.

Delivered through our global service network of engineers and service centers, Vertiv™ Next Predict is part of a fully integrated lifecycle approach - supporting everything from installation and optimization to modernization and asset planning.

Customer Monitoring Interfaces

LCD touch screen features

- High security access with separate password levels for users and service engineers
- User-friendly graphical interface
- Single-line mimic diagram showing system status
- Dedicated warning/fault and event log page used to monitor UPS status and important events
- Dedicated measurements page for all UPS internal functional blocks

Hardware connectivity

Vertiv™ Trinergy™ allows for the monitoring and control of networked UPS, through different protocol options:

- The integration of UPS with Building Monitoring and Automation Systems via MODBUS RTU, MODBUS/TCP or JBUS protocols
- The integration of UPS in Network Management Systems through SNMP protocol
- Two slots for additional connectivity cards are available for specific protocol requirements

Software connectivity

Vertiv connects and protects your network with core-to-edge solutions and unmatched expertise. For maximum visibility and effective monitoring in one view, pair your Vertiv™ UPS with a software solution.

Vertiv™ Environet™ Alert

Vertiv Environet Alert provides industry companies with critical facility monitoring software that is affordable and easy to use. This solution delivers superior monitoring, alerting, trending and data organization. Get monitoring, alerting and trending at a price that's right for your business.

Technical data Vertiv™ Trinergy™ 480V 3W UL

		1500 kW UL 480V 3W	1600 kW UL 480V 3W	2000 kW UL 480V 3W	2500 kW UL 480V 3W
Primary input					
Nominal mains input voltage / voltage range [6]	(V)	480 (408 to 552) 3Ph+PE	480 (432 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE
Nominal frequency / frequency tolerance	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Input Power Factor		≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99
Input current distortion (THDi)	(%)	≤3	≤3	≤3	≤3
Walk in/soft start	(seconds)	15 (1 to 90 selectable)	15 (1 to 90 selectable)	15 (1 to 90 selectable)	15 (1 to 90 selectable)
Rectifier Hold-Off	(seconds)	0 (0 to 240 selectable)	0 (0 to 240 selectable)	0 (0 to 240 selectable)	0 (0 to 240 selectable)
Inrush current / Imax input		≤1	≤1	≤1	≤1
Inverter output					
Nominal apparent power	(kVA)	1500	1600	2000	2500
Nominal active power	(kW)	1500	1600	2000	2500
Nominal output current @ nominal voltage 480V	(A)	1804	1925	2406	3007
Maximum output active power @ 35°C	(kW)	1500	1600	2000	2500
Inverter overload capacity [5]		110% continuous, 125% for 10mins, 150% for 1min	110% continuous, 125% for 10mins, 150% for 1min	110% continuous, 125% for 10mins, 150% for 1min	110% continuous, 125% for 10mins, 150% for 1min
Short circuit current for 200ms [1] [2]		Up to 2 In	Up to 2 In	Up to 2 In	Up to 2 In
Nominal output voltage	(V)	480 (408 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE
Nominal output frequency	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Output load power factor without derating		0,7 leading - 0,4 lagging	0,7 leading - 0,4 lagging	0,7 leading - 0,4 lagging	0,7 leading - 0,4 lagging
Voltage stability in steady state condition for input (AC & DC) variations and step load (0 to Nominal load)	(%)	±1	±1	±1	±1
Voltage stability in dynamic condition for input variation (AC & DC) and step load	(%)	Complies with IEC/EN 62040-3, Class 1	Complies with IEC/EN 62040-3, Class 1	Complies with IEC/EN 62040-3, Class 1	Complies with IEC/EN 62040-3, Class 1
Voltage stability in steady state for 100% load imbalance (0, 0, 100)	(%)	±3	±3	±3	±3
Frequency slew rate	(Hz/sec)	<1 default (selectable up to 5 Hz)	<1 default (selectable up to 5 Hz)	<1 default (selectable up to 5 Hz)	<1 default (selectable up to 5 Hz)
Output voltage distortion at nominal linear load	(%)	<1.5	<1.5	<1.5	<1.5
Output voltage distortion @ reference non linear load as for IEC/EN 62040-3	(%)	<5	<5	<5	<5
Load crest factor handled without derating the UPS	(Ipk/Irms)	3:1	3:1	3:1	3:1
Phase angle precision with balanced loads	(degrees)	±1	±1	±1	±1
Phase angle precision with 100% unbalanced loads	(degrees)	±2	±2	±2	±2
DC source					
Battery types		VRLA, Li-Ion, Ni-Zn	VRLA, Li-Ion, Ni-Zn	VRLA, Li-Ion, Ni-Zn	VRLA, Li-Ion, Ni-Zn
Permissible battery voltage range	(V)	396 to 700	396 to 700	396 to 700	396 to 700
Recommended n° of VRLA cells:		240-300	240-300	240-300	240-300
Float voltage for VRLA @ 20 °C	(V/cell)	2.27	2.27	2.27	2.27
End cell voltage for VRLA	(V/cell)	1.65	1.65	1.65	1.65
Float voltage stability in steady state condition	(%)	≤1	≤1	≤1	≤1
DC ripple voltage without battery	(%)	≤1	≤1	≤1	≤1
Optimum battery temperature	(°C)	15 to 25	15 to 25	15 to 25	15 to 25
Battery recharge current setting range for 240cells @ 480V input voltage & maximum output load (PF=1) [4]	(A)	513	342	684	855
Battery monitoring		Dry contacts, BIB or Modbus	Dry contacts, BIB or Modbus	Dry contacts, BIB or Modbus	Dry contacts, BIB or Modbus

		1500 kW UL 480V 3W	1600 kW UL 480V 3W	2000 kW UL 480V 3W	2500 kW UL 480V 3W
Static bypass					
Nominal bypass input voltage [6]	(V)	480 (408 to 552) 3Ph+PE	480 (432 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE	480 (408 to 552) 3Ph+PE
Nominal bypass input voltage range [6]	(%)	±10 (5 to 15 selectable)	±10 (5 to 15 selectable)	±10 (5 to 15 selectable)	±10 (5 to 15 selectable)
Nominal output frequency	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Frequency range	(%)	±1 (2, 3, 4 selectable)	±1 (2, 3, 4 selectable)	±1 (2, 3, 4 selectable)	±1 (2, 3, 4 selectable)
Prospective short circuit current Icp with bypass fuses	(kA)	200	200	200	200
Maximum static bypass overload capacity:					
For 10 minutes	(%)	125	125	125	125
For 1 minute	(%)	150	150	150	150
Transfer time whit inverter synchronous to bypass:					
Inverter to Bypass	(ms)	No break	No break	No break	No break
Bypass to Inverter	(ms)	<2ms	<2ms	<2ms	<2ms
General system data					
AC/AC efficiency VFI without charging current @ nominal input conditions [3] [4] with resistive load:		Up to 97.4%	Up to 97.4%	Up to 97.4%	Up to 97.4%
AC/AC efficiency with dynamic online (VI) without charging current @ nominal input conditions [3] [4] with maximum resistive load:		≥ 99%	≥ 99%	≥ 99%	≥ 99%
AC/AC efficiency in Intelligent ECO mode without charging current @ nominal input conditions [3] [4] with maximum resistive load:		≥ 99%	≥ 99%	≥ 99%	≥ 99%
Prospective short circuit current Icp with bypass fuses	(kAIC)	200	200	200	200
Heat dissipation @ nominal input conditions and nominal output load:					
Float mode VFI	(BTU/h)	207702	221411	276936	346170
	(kW)	60.9	64.9	81.2	101.5
Float mode VFD	(BTU/h)	67410	71859	89880	112350
	(kW)	19.8	21.1	26.4	33.0
Mechanical dimensions:					
Height	(mm)	2010	2010	2010	2010
Width	(mm)	3850	3850	4850	6375
Depth	(mm)	1050	1050	1050	1050
Net weight	(kg)	3800	3800	4710	6190
Noise @ 1 meter [3] [4] as per ISO 7779/3746 at full load	(dBA ± 2dBA)	72	72	72	72
Protection degree with open doors		IP20	IP20	IP20	IP20
Fame colour (RAL scale)		7021	7021	7021	7021
Cable entry		Top/bottom	Top/bottom	Top/bottom	Top/bottom
Service access		Front and top	Front and top	Front and top	Front and top
Access		Front and top (no rear access required)	Front and top (no rear access required)	Front and top (no rear access required)	Front and top (no rear access required)
Cooling		Forced ventilation, front air intake, top air outlet	Forced ventilation, front air intake, top air outlet	Forced ventilation, front air intake, top air outlet	Forced ventilation, front air intake, top air outlet

		1500 kW UL 480V 3W	1600 kW UL 480V 3W	2000 kW UL 480V 3W	2500 kW UL 480V 3W
Environmental					
Location		Indoor (free from corrosive gases and conductive dust)	Indoor (free from corrosive gases and conductive dust)	Indoor (free from corrosive gases and conductive dust)	Indoor (free from corrosive gases and conductive dust)
Operating temperature	(°C)	0 to 50 with automatic derating from 40°C	0 to 50 with automatic derating from 40°C	0 to 50 with automatic derating from 40°C	0 to 50 with automatic derating from 40°C
Maximum relative humidity @ 20 °C (non condensing)	(%)	Up to 95 with humidity control and correction	Up to 95 with humidity control and correction	Up to 95 with humidity control and correction	Up to 95 with humidity control and correction
Max altitude above sea level without derating	(m)	1000 (for higher altitudes complies with IEC/EN 62040-3)	1000 (for higher altitudes complies with IEC/EN 62040-3)	1000 (for higher altitudes complies with IEC/EN 62040-3)	1000 (for higher altitudes complies with IEC/EN 62040-3)
Immunity to electrical interference		IEC / EN / BS 62040-2	IEC / EN / BS 62040-2	IEC / EN / BS 62040-2	IEC / EN / BS 62040-2
EMC Class		IEN / EN 62040-2 Class C3	IEN / EN 62040-2 Class C3	IEN / EN 62040-2 Class C3	IEN / EN 62040-2 Class C3
Environmental aspects		IEC/ EN/ 62040-4	IEC/ EN/ 62040-4	IEC/ EN/ 62040-4	IEC/ EN/ 62040-4
Classification according to IEC/EN 62040-3		VFI-SS-111	VFI-SS-111	VFI-SS-111	VFI-SS-111
Options		Dynamic grid support	Dynamic grid support	Dynamic grid support	Dynamic grid support
		Ai loads management	Ai loads management	Ai loads management	Ai loads management
		Integrated backfeed Protection device	Integrated backfeed Protection device	Integrated backfeed Protection device	Integrated backfeed Protection device
		DC ground fault detection	DC ground fault detection	DC ground fault detection	DC ground fault detection
		EPO push button	EPO push button	EPO push button	EPO push button
		Flange connections	Flange connections	Flange connections	Flange connections
		Vertiv™ Life™ Services Remote Diagnostic and Preventive Monitoring	Vertiv™ Life™ Services Remote Diagnostic and Preventive Monitoring	Vertiv™ Life™ Services Remote Diagnostic and Preventive Monitoring	Vertiv™ Life™ Services Remote Diagnostic and Preventive Monitoring
		Battery trip option	Battery trip option	Battery trip option	Battery trip option
Network protocols with monitoring card		Modbus TCP	Modbus TCP	Modbus TCP	Modbus TCP
		BACnet/WS	BACnet/WS	BACnet/WS	BACnet/WS
		BACnet/IP	BACnet/IP	BACnet/IP	BACnet/IP
		SNMP v.1, v.3, IPv6	SNMP v.1, v.3, IPv6	SNMP v.1, v.3, IPv6	SNMP v.1, v.3, IPv6

Note:

(1) Short circuit values depend on UPS rating, please contact Vertiv Technical Support for more information

(2) Values specified for single unit. Units in parallel may have different values due to contribution of the parallel connections. Please contact Vertiv Technical Support for more information

(3) For tolerance see IEC/EN 60146-1-1 or DIN VDE 0558. The data refer to 25°C ambient temperature

(4) At nominal voltage, nominal frequency

(5) Value obtained at 25°C

(6) In case of a split input configuration, the primary input and the bypass input must have a common neutral reference

Technical data Vertiv™ Trinergy™ 415V 4W

In UL markets 415V 4 wire distribution offers clear advantages over the traditional 480 V 3-wire architecture. By providing 240V line-to-neutral directly to the IT load, it removes the need for step-down transformers downstream the PDU, reducing energy losses, power train complexity and footprint. 415V 4W also allows higher power density at the rack level with lower current and smaller conductors, supporting the increasing demands of AI GPU and HPC infrastructures. At the same time, it aligns with the voltage range natively supported by modern IT equipment, while harmonizing with the global 415/240 V standard already deployed in Europe and Asia.

		1500 kW UL 415V 4W	1600 kW UL 415V 4W	2000 kW UL 415V 4W
Primary input				
Nominal mains input voltage / voltage range [6]	(V)	415 (353 to 477), 3Ph+PE+N	415 (374 to 477), 3Ph+PE+N	415 (353 to 477), 3Ph+PE+N
Nominal frequency / frequency tolerance	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Input power factor		≥ 0.99	≥ 0.99	≥ 0.99
Input current distortion (THDi)	(%)	≤3	≤3	≤3
Walk in/soft start	(seconds)	15 (1 to 90 selectable)	15 (1 to 90 selectable)	15 (1 to 90 selectable)
Rectifier hold-off	(seconds)	0 (0 to 240 selectable)	0 (0 to 240 selectable)	0 (0 to 240 selectable)
Inrush current / Imax input		≤1	≤1	≤1
Inverter output				
Nominal apparent power	(kVA)	1500	1600	2000
Nominal active power	(kW)	1500	1600	2000
Nominal output current @ nominal voltage 415V	(A)	2089	2228	2785
Maximum output active power @ 35°C	(kW)	1500	1600	2000
Inverter Overload Capacity [5]		110% continuous, 125% for 10mins, 150% for 1min	110% continuous, 125% for 10mins, 150% for 1min	110% continuous, 125% for 10mins, 150% for 1min
Short circuit current for 200ms [1] [2]		Up to 2 In	Up to 2 In	Up to 2 In
Nominal output voltage	(V)	415 (353 to 477), 3Ph+PE+N	415 (353 to 477), 3Ph+PE+N	415 (353 to 477), 3Ph+PE+N
Nominal output frequency	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Output load power factor without derating		0,7 leading - 0,4 lagging	0,7 leading - 0,4 lagging	0,7 leading - 0,4 lagging
Voltage stability in steady state condition for input (AC & DC) variations and step load (0 to Nominal load)	(%)	±1	±1	±1
Voltage stability in dynamic condition for input variation (AC & DC) and step load	(%)	Complies with IEC/EN 62040-3, Class 1	Complies with IEC/EN 62040-3, Class 1	Complies with IEC/EN 62040-3, Class 1
Voltage stability in steady state for 100% load imbalance (0, 0, 100)	(%)	±3	±3	±3
Output voltage distortion at nominal linear load	(%)	<1.5	<1.5	<1.5
DC source				
Battery types		VRLA, Li-Ion, Ni-Zn	VRLA, Li-Ion, Ni-Zn	VRLA, Li-Ion, Ni-Zn
Permissible battery voltage range	(V)	396 to 700	396 to 700	396 to 700
Recommended n° of VRLA cells:		240-300	240-300	240-300
Float voltage for VRLA @ 20 °C	(V/cell)	2.27	2.27	2.27
End cell voltage for VRLA	(V/cell)	1.65	1.65	1.65
Float voltage stability in steady state condition	(%)	≤1	≤1	≤1
DC ripple voltage without battery	(%)	≤1	≤1	≤1
Optimum battery temperature	(°C)	15 to 25	15 to 25	15 to 25
Battery recharge current setting range for 240cells @ 415V input voltage & maximum output load (PF=1) [4]	(A)	459	291	612
Battery monitoring		Dry contacts, BIB or Modbus	Dry contacts, BIB or Modbus	Dry contacts, BIB or Modbus

		1500 kW UL 415V 4W	1600 kW UL 415V 4W	2000 kW UL 415V 4W
Static bypass				
Nominal bypass input voltage [6]	(V)	415 (353 to 477), 3Ph+PE+N	415 (374 to 477), 3Ph+PE+N	415 (353 to 477), 3Ph+PE+N
Nominal bypass input voltage range [6]	(%)	±10 (5 to 15 selectable)	±10 (5 to 15 selectable)	±10 (5 to 15 selectable)
Nominal output frequency	(Hz)	Selectable 50 or 60	Selectable 50 or 60	Selectable 50 or 60
Frequency range	(%)	±1 (2, 3, 4 selectable)	±1 (2, 3, 4 selectable)	±1 (2, 3, 4 selectable)
Prospective short circuit current Icp with bypass fuses	(kA)	200	200	200
Maximum static bypass overload capacity:				
For 10 minutes	(%)	125	125	125
For 1 minute	(%)	150	150	150
Transfer time whit inverter synchronous to bypass:				
Inverter to bypass	(ms)	No break	No break	No break
Bypass to inverter	(ms)	<2ms	<2ms	<2ms
General system data				
AC/AC efficiency VFI without charging current @ nominal input conditions [3] [4] with resistive load:		Up to 97.2%	Up to 97.2%	Up to 97.2%
AC/AC efficiency with dynamic online (VI) without charging current @ nominal input conditions [3] [4] with maximum resistive load:		≥ 99%	≥ 99%	≥ 99%
AC/AC efficiency in Intelligent ECO mode without charging current @ nominal input conditions [3] [4] with maximum resistive load:		≥ 99%	≥ 99%	≥ 99%
Prospective short circuit current Icp with bypass fuses	(kAIC)	200	200	200
Heat dissipation @ nominal input conditions and nominal output load:				
Float mode VFI	(BTU/h)	207702	221411	276936
	(kW)	60.9	64.9	81.2
Float mode VFD	(BTU/h)	67410	71859	89880
	(kW)	19.8	21.1	26.4
Mechanical dimensions:				
Height	(mm)	2010	2010	2010
Width	(mm)	5100	5100	5700
Depth	(mm)	1050	1050	1050
Net weight	(kg)	4850	4850	5540
Noise @ 1 meter [3] [4] as per ISO 7779/3746 at full load	(dBA ± 2dBA)	72	72	72
Protection degree with open doors		IP20	IP20	IP20
Cable entry		Top/bottom	Top/bottom	Top/bottom
Service access		Front and top	Front and top	Front and top
Cooling		Forced ventilation, front air intake, top air outlet	Forced ventilation, front air intake, top air outlet	Forced ventilation, front air intake, top air outlet
Operating temperature	(°C)	0 to 50 with automatic derating from 40°C	0 to 50 with automatic derating from 40°C	0 to 50 with automatic derating from 40°C
Maximum relative humidity @ 20 °C (non condensing)	(%)	Up to 95 with humidity control and correction	Up to 95 with humidity control and correction	Up to 95 with humidity control and correction

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