

Product & Service Catalogue



CAB 2

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What makes us different?

Our aim is simple – to be the best power protection company there is.

Together with our parent company, the Kohler Company's Power Group, Uninterruptible Power Supplies Limited (UPS Ltd) is a driving force within the power protection industry offering pioneering product technology, service excellence and global reach.

Best in class power protection solutions

Central to our product portfolio is a range of the highest quality, class-leading three-phase and single-phase uninterruptible power supplies. Developed to offer the highest levels of efficiency, availability, scalability and flexibility.

Leveraging Kohler's technical leadership in global power protection, the full power protection portfolio includes:

Uninterruptible power supply (UPS)

Standby diesel generators

Battery systems

Emergency lighting static inverters

Switchgear

Software and ancillaries

Service excellence guaranteed

UPS Ltd has built an outstanding reputation for service excellence through its unrivalled pre and post sales support. Our wide range of services includes initial site surveys, system design, installation & commissioning, preventative maintenance, training, remote monitoring and technical support.

With 24/7 availability, all these services are delivered by a dedicated and extensive network of trained service engineers and service support staff - ensuring lifelong and reliable operation of the power protection solutions it provides.

Quality management and certifications

UPS Ltd's quality management system is certified to BSI EN ISO 9001:2008, its environmental procedures to ISO 14001 and its health & safety procedures to OHSAS 18001, and is recognised as an Investor in People. UPS Ltd is also certified under the SafeContractor scheme. These certifications guarantee that all its customer obligations under health and safety and environmental legislation are met.

Why choose us?

UPS Ltd takes a comprehensive, end-to-end approach to meeting our customers' specific and demanding requirements. From initial contact through installation, service, maintenance and disposal, UPS Ltd provides its customers with an unrivalled partner for complete peace of mind.

We understand that every client is different and each has its own specific opportunities to consider and challenges to overcome. The key, we believe, is to spend the time required to truly understand the business and how it operates. Only then can we apply our comprehensive product range, combined with our broad support services offering, to provide power protection solutions which exceed expectations.

This also means UPS Ltd continuously invests in product and system development, the talent of its employees, broadening its range of services, and improving its service delivery. By doing so, UPS Ltd expertly meets the present and future needs of its customers and achieves its objective – to be a leader of power protection solutions and services.

About Kohler Co.

Established in 1873, Kohler Co. has a pedigree for quality, innovation and exceptional craftsmanship. In 1920, it launched the world's first engine powered electric generator. Since then, it has been developing products for every aspect of critical load protection and is one of the world's largest power protection equipment manufacturers with products in use on every continent.

Together, UPS Ltd and Kohler bring a potent, global force of longevity, pedigree, pioneering product technology, service excellence and global reach to the power protection industry.

The UPS Ltd mission
To continuously delight our customers through the provision of industry-leading Power Protection Solutions and Support Services.



Made in Switzerland

For almost 20 years, UPS Ltd has led the UK in terms of power protection innovation. Today, the company is recognised as one of the industry's most innovative organisations – thanks in part to the success of its class-leading products and services, and the introduction of game-changing technologies to the UK market – several of which are now considered almost ubiquitous within the power protection industry.

Throughout this period, UPS Ltd has worked with a single manufacturing partner, based in Switzerland, where the vast majority of UPS Ltd's products are designed and constructed. This consistency and close cooperation benefits UPS Ltd's clients in countless ways, not least through additional resources and investment, and access to an extensive team of R&D specialists in more than 20 countries.



Product overview: Industry-leading products

UPS Ltd's product portfolio contains some of the most technologically advanced power protection products. At the core of its product portfolio is a range of high quality and reliable three-phase and single-phase uninterruptible power supplies.

Single-phase UPS from 1-20 kVA

Three-phase transformerless UPS from 10-500 kVA scalable up to 5 MVA

Standby diesel generators

Battery systems

Switchgear

Emergency lighting static inverters

Software and ancillaries

Service overview

24/7 onsite service

Initial site survey

System design

Installation

Commissioning

Preventative maintenance

Repair

Battery maintenance, replacement and testing

Capacitor replacement

Remote monitoring

Load bank testing

Witness testing

Disposal

Enhanced Capital Allowance Scheme

Specific products within UPS Ltd's product range are now included on the Carbon Trust's Enhanced Capital Allowance approved product list. This offers customers the opportunity of significant tax savings on the capital investment, and the knowledge that they are purchasing equipment with class-leading efficiency.

Market overview

From financial services and Colo providers to retail and manufacturing giants, UPS Ltd's products are being utilised in a broad range of markets, supporting an even broader range of applications.

Regardless of whether you need a multi-MVA system to support a tier 4-data centre or a 10 kVA UPS to support an emergency lighting system, UPS Ltd has the perfect solution. Our teams of sales managers and engineers have extensive experience in developing tailor-made solutions, specifically designed to meet your particular challenges and ensure that any requirement can be satisfied, no matter the business or area of operation.

"UPS Ltd came with a very competitive quote and an excellent reputation for support and service. After looking at the PowerWAVE 9000DPA it was clear it offered the best solution. It had the N+1 redundancy we wanted and with its modular technology it provided the flexibility to expand the system in line with our growth, eliminating unnecessary capital expenditure at the outset and avoiding excessive energy costs."

Conleth McCallan
Managing Director
Datatnet

Customer recommendation

"UPS Ltd carried out a number of installations for Fujitsu in the South, most of these being the conventional transformer-based units that they were licenced to supply and maintain. This was important to us because we insist that the manufacturer or their approved agents maintain business critical equipment, such as UPS. They were very qualified in this respect and provided an excellent service for many years.

In our building portfolio, across the UK, we have had just about every make and type of UPS. Therefore, we have both user experience of the equipment and the company's service support.

We recognised the benefits of the modular UPS concept in terms of its scalability and the energy savings that would be gained from having more accurately sized UPS units to enable them to run more efficiently, but still provide the required resilience, particularly when combined with the use of transformerless technology.

We then looked at all the modular systems available and concluded that not all are truly modular. Also, that the efficiencies claimed by some were sometimes misleading. We chose the UPS Ltd system because it appeared to meet all our requirements.

Initially, we had a number of quite small modular installations, but the advantages of these over conventional UPS systems were immediately apparent and it wasn't long before we were using the facility to hot swap units between buildings to meet their increasing or decreasing loads as our business requirements changed.

Using these same modular units in one of our buildings, we now have a 500 kVA UPS consisting of 10 x 50 kVA modules with the facility to add another five modules if increased capacity is required in the future.

The energy savings achieved using this system surpassed all expectations and our M&E consultants also now recommend these systems, where appropriate.

About 5 years ago, UPS Ltd were nominated as our preferred supplier of UPS equipment. This decision was based on their product range and service to us. I am certain that you too will be impressed with their products and customer service."

Chris Ives
Engineering Services Manager
Fujitsu



UPS Ltd Products

UPS Ltd's product portfolio contains some of the most technologically advanced power protection products. At the core of its product portfolio is a range of high quality and reliable three-phase and single-phase uninterruptible power supplies.



Single Phase

MINIpowerPLUS (1-10 kVA)



The most reliable and resilient single-phase UPS currently available, a must for all professional users.

Single-phase, scalable critical power protection up to 10 kVA.

The MINIpowerPLUS range is ideal for small low power protection applications where reliable power must be scaled to cost and space constraints. Available in an office-friendly tower or compact 19" rack-mounted modular configuration, the MINIpowerPLUS is the most reliable and resilient single-phase UPS currently available.

MINIpowerPLUS

Expandable in 1.25 kVA modular steps to 10 kVA

Online double conversion technology for a clean and protected supply

Internal N+1 parallel redundancy for high availability and reliability

Easy-to-use LCD interface for programming, status reporting and diagnostics

Expandable up to 8 hours' battery autonomy

Tower or 19" rack-mounted configurations

Onsite, flexible upgrade capability

Near unity input power factor at partial and full loads



Total flexibility

Ability to 'right size' the system

Simple installation of new UPS modular power boards

Reduced total cost of ownership

Total flexibility is a key benefit of the MINIpowerPLUS. It is possible to simply add UPS power boards – in cost-effective incremental steps – to the MINIpowerPLUS as the critical load requirement grows. This ensures the UPS is 'right sized' to the critical load at initial installation. This 'right sizing' reduces initial costs, optimises operating efficiency and helps reduce the total cost of ownership. Adding or replacing existing boards also enables easy system upgrades or repairs.

Battery autonomy is similarly flexible, and can be customised using battery kits. These can be standalone or integrated with the UPS power boards. Full-load battery standby time of up to eight hours is available with a rapid recharge capability. Battery redundancy can also be built-in for guaranteed continuity of supply.

The right solution

MINIpowerPLUS is available in two different versions

MINIpowerPLUS tower

MINIpowerPLUS tower systems deliver up to either 5 kVA (MINIpowerPLUS 5000) or 10 kVA (MINIpowerPLUS 10000) in a compact unit measuring only 270 x 475 x 570mm.

MINIpowerPLUS 5000 uses the space-saving single tower to accommodate up to four 1.25 kVA UPS power boards and four strings of batteries. Battery autonomy can be increased by adding a separate battery cabinet.

MINIpowerPLUS 10000 allows four to eight 1.25 kVA UPS power boards to be accommodated in one tower to provide a maximum output of 10 kVA. Up to ten strings of batteries can be housed in a separate cabinet.

MINIpowerPLUS rack

MINIpowerPLUS rack-mounted version uses 6U of a standard 19" rack. With four UPS power boards, this version provides up to 5 kVA in capacity or 3.75 kVA in parallel redundant (N+1) mode. Batteries are internal. Autonomy can be extended simply by mounting additional batteries in a separate rack-mounted battery unit.

Features of both the tower and rack-mounted MINIpowerPLUS include automatic bypass, battery test function, load/temperature dependent fan speed and an RS232 port allowing the use of diagnostic or auto-shutdown software.

High up time

Internal N+1 parallel redundancy

If one of the modules stops working, the others will all continue supplying the load without any interruption, redistributing the percentage of load that was previously supplied by the module now out of order. This redundancy ensures continuous up time.



MINIpowerPLUS tower



MINIpowerPLUS rack



PowerWAVE 1000 (1-10 kVA)



For server, network, storage, VoIP and telecommunication applications – combining high reliability with low upfront costs to make it the perfect solution for mission critical applications.

PowerWAVE 1000

Compact design, offered in both 19" rack and tower versions

Up to 94% efficiency

High efficiency eco-mode

0.9 power factor (1 kVA, 2 kVA and 3 kVA)

Unity power factor (4.5 kVA, 6 kVA, 8 kVA and 10 kVA)

Interfaces: USB, RS-232, SNMP, Modbus, potential free contacts, EPO contact inputs

Flexible battery configuration – programmable number of batteries (4.5 kVA, 6 kVA, 8 kVA and 10 kVA)

Designed for single-phase uninterruptible power supply requirements.

Manufactured with the flexibility to meet the demands of today's critical applications, the PowerWAVE 1000 can be used as a standalone UPS device or installed into a standard 19" rack configuration, with connectivity options available for each.

The UPS completely regenerates the utility power to correct power disturbances in the mains and provides clean AC power, with voltage and frequency independency from the mains power supply (VFI).



Hot-swappable batteries

Replace or add battery packs with no downtime/no risk

With the PowerWAVE 1000's front access panel, replacing battery packs no longer requires the critical load to be interrupted, ensuring you are always protected 24/7.

With the 4.5 kVA, 6 kVA, 8 kVA and 10 kVA versions, the number of batteries is programmable allowing for a flexible battery configuration.

High reliability

Automatic (4.5–10 kVA UPS) redundant parallel operation

Increasing load and protection levels is made quick and easy with the PowerWAVE 1000. A larger load or N+1 parallel redundancy can easily be achieved by simply connecting up to four units, using the CAN-bus (RJ45) on the rear of the unit. Versions are available for 1, 2, 3 or 4 x UPS to create a 1+1, 2+1 or 3+1 redundancy system. This 'right sizing' reduces initial cost, optimises operating efficiency and helps reduce total cost of ownership.

In addition, matching battery cabinets can be added to extend the back-up time for several hours.

Advanced battery discharge management

Reduced recovery time from discharge

The PowerWAVE 1000 automatically manages the end-discharge voltage of the internal batteries according to the load, preventing deep discharge of the batteries during a power failure.

User-friendly display

Quick glance screen

An easy-to-read display provides a real-time view of all major system parameters and current status, including load level, battery level, system wiring faults, overload and programmable output status.

Power distribution and bypass management

Optional manually operated maintenance bypass switch, which facilitates electrical and physical isolation of the UPS. Power distribution (1, 2 and 3 kVA UPS) facilitates easy electrical connection of devices to the UPS. The units can fit in as a tower or rack version.

Low cost of ownership

High operating efficiency

0.9/Unity power factor & low input THDi

The PowerWAVE 1000 delivers high efficiency of up to 94%. The eco mode allows this to be increased to 98%.

The PowerWAVE 1000 provides an output factor of 0.9 (1 kVA, 2 kVA and 3 kVA) and unity (4.5 kVA, 6 kVA, 8 kVA and 10 kVA), as well as a low input THDi of <3%.



PowerWAVE 3000/TP (10 & 20 kVA)

Single-phase UPS for midsize server rooms, networks, telecommunications systems and industrial processes.

PowerWAVE 3000/TP

Energy savings up to 93% efficiency

97% efficiency in ECO mode

Low harmonic distortions (< 5% THDi) and active power factor correction (0.99 input PF) eliminate interference from other equipment in the network

Paralleling up to 4 units allows for increase of capacity and introduction of redundancy to system to enhance availability

Integrated manual bypass switch simplifies maintenance and reduces need for external switchgears

Can operate as frequency converter (50 Hz to/from 60 Hz)

Power factor 0.9

Same model supports different wiring schemes: three-phase and single-phase input as well as single and dual input feed

Extended autonomy with matching battery cabinets

Compact, single-phase critical power protection up to 20 kVA.

The PowerWAVE 3000/TP UPS delivers reliable power, low running costs, long battery life, easy maintenance and high levels of flexibility.

Featuring double-conversion, voltage and frequency independent (VFI) topology, the PowerWAVE 3000/TP is available in both 10 and 20 kVA versions, with the option to configure up to four units in parallel to boost power capability or provide redundancy.

Three-phase or single-phase inputs can also be accommodated, as well as single or dual supply inputs – allowing the customer to manage two independent power sources.

Simple to install and with a small footprint, the PowerWAVE 3000/TP provides stable, regulated, transient-free, pure sine wave AC power with extremely tight output voltage regulation.





Reliable

Online double conversion topology delivers constant and stable power to the load even in the presence of severe disturbances in the utility

Parallelable up to four units to provide system redundancy

Programmed and automated battery tests ensure an optimised battery management, operation and lifetime

Flexible

Single or three-phase input is field configurable – adaptable to installation requirements

Single or dual input power source compatible (field configurable)

Scalable

Different autonomy variations with inbuilt batteries or additional battery cabinets

Simple power increase (pay-as-you-grow) by paralleling up to four units

Communication options

Through monitoring devices, any abnormal situation (events/alarms) can be detected immediately

Dry-contact card – relay interface card enables advanced communication between the UPS systems

Network interface cards – control and monitoring of the UPS via a web browser

Sensors – combined with the network interface card, humidity and temperature sensors can be integrated into the system and monitored remotely via a web browser

Battery options

Additional battery cabinets that match perfectly with the UPS for scaling autonomy time

Reduced costs

High efficiency reduces the quantity of power consumed by your installation

Reduced heat losses maintain a lower operating temperature, prolonging the lifetime of components and batteries

The small footprint saves space and makes installation simpler

Battery runtime (half load/full load)

	10 kVA	20 kVA
UPS internal battery	39 / 16	16 / 5
UPS + battery cabinet	152 / 70	70 / 29



Three Phase

PowerWAVE 5000/TP (10-50 kVA)



Three-phase UPS for midsize server rooms, networks, telecommunication systems and industrial processes.

A true on-line, double-conversion, VFI (voltage frequency independent) UPS that provides enhanced power protection in a compact format.

Its outstanding price and performance deliver the best value for money in its category with uncompromised system reliability and power availability.

PowerWAVE 5000/TP

Capacities from 10 kVA to 50 kVA
three phase

On-line double conversion,
transformerless technology for high
reliability

Parallel capability of up to 20 units

Intelligent battery management

95.5% efficiency across a wide load
range

Integral batteries

Near unity input power factor (0.99)

Low input harmonic distortion
(THDi <3%)

Small footprint and low weight

Ergonomic design for easy serviceability

Energy saving and low carbon footprint

Extended autonomy with matching
battery cabinets



Flexible battery configuration

Optimal sizing of the battery capacity
30–50 kVA with different sized cabinets

Extended autonomy with matching battery cabinets

The PowerWAVE 5000/TP is available in three cabinet sizes, enabling you to choose the ideal capacity and required autonomy for your critical load. The smaller 10–25 kVA units are available in two cabinet sizes, dependent on the required level of autonomy, with the larger units (25–50 kVA) available in a third cabinet size, which can house both 7/9Ah and 28Ah batteries.

Additional battery cabinets that match perfectly with the UPS for scaling autonomy time.

Space saving

Reduced footprint
Valuable floor space maximised

With a footprint of only 0.4m² at 50 kVA, the PowerWAVE 5000/TP has a power density of up to 100kW/m². As a result, substantial and valuable space savings are achieved even at the highest power ratings.

- LCD display
- Output contacts and SNMP card (optional)
- Customer inputs RS232 interface
- Rectifier & bypass fuses
- Batteries
- Battery fuses
- Maintenance bypass switch
- Parallel isolator
- Battery containment
- Input/output connection

Highest load availability

Productivity maximised, 'downtime' minimised

PowerWAVE 5000/TP offers class leading reliability by incorporating redundant critical circuits (RCC) which duplicate all of the critical components and circuitry within the UPS. Some UPS have single points of failure. PowerWAVE 5000/TP overcomes this problem and offers exceptional reliability and availability under all circumstances.

Paralleled systems are designed to ensure availability by significantly increasing system redundancy. In the case of a power failure, should a UPS unit fail, the remaining units are still able to continue to support the critical load. Redundant paralleled systems also enable regular maintenance to be carried out on the system without any requirement to remove the critical load from conditioned power.

High efficiency for lowest lifetime costs

High efficiency at partial and rated loads
Low carbon footprint

With a transformerless design and Energy Saving Inverter Switching (ESIS) technology, PowerWAVE 5000/TP delivers very high efficiency at partial and rated loads (up to 95.5%). This level of efficiency dramatically reduces the total cost of ownership of the UPS during its lifecycle.

Ripple-free and optional temperature controlled battery chargers protect batteries and extend the life-time performance, further reducing running costs.

These benefits combine to make the PowerWAVE 5000/TP a truly eco-friendly solution for all power protection requirements.



PowerWAVE 5000/TP range

UPS cabinet A (10–20 kVA)



Dimensions (W x H x D)

345 x 720 x 710 mm

Weight without battery

10 kVA: 60 kg

15 kVA: 62 kg

20 kVA: 64 kg

Weight with 48 x 7/9 Ah battery

10 kVA: 180 kg

15 kVA: 182 kg

20 kVA: 184 kg



Available in three different cabinet sizes

Cabinet A: 10 – 20 kVA

Cabinet B: 10 – 25 kVA

Cabinet C: 25 – 50 kVA

UPS cabinet B (10–25 kVA)



Dimensions (W x H x D)

345 x 1045 x 710 mm

Weight without battery

10 kVA: 88 kg

15 kVA: 90 kg

20 kVA: 92 kg

25 kVA: 94 kg

Weight with 96 x 7/9 Ah battery

10 kVA: 328 kg

15 kVA: 330 kg

20 kVA: 332 kg

25 kVA: 334 kg

UPS cabinet C (25–50 kVA)



Dimensions (W x H x D)

440 x 1420 x 910 mm

Weight: 7/9 Ah cabinet without battery

25 kVA: 151 kg

30 kVA: 160 kg

40 kVA: 165 kg

50 kVA: 170 kg

Weight: 28 Ah cabinet without battery

25 kVA: 135 kg

30 kVA: 145 kg

40 kVA: 150 kg

50 kVA: 155 kg

Weight with 144 x 7/9 Ah battery

25 kVA: 540 kg

30 kVA: 550 kg

40 kVA: 555 kg

50 kVA: 560 kg

Weight with 48 x 28 Ah battery

25 kVA: 605 kg

30 kVA: 615 kg

40 kVA: 620 kg

50 kVA: 625 kg

PowerWAVE 6000

(60-500 kVA 500 kW)

The best combination of energy efficiency, reliability and low cost of ownership – capacity from 60 kVA to 5 MVA.

PowerWAVE 6000

Single unit capacities from 60 kVA to 500 kVA

Capacity up to 5 Megawatts (5 MVA) with 10 units in parallel

Power density of up to 363kW/m²

High efficiency and minimum cost of ownership

Low input harmonic distortion: THDi =3.5%

Near unity input power factor of 0.99

Fully rated output power (blade friendly)

Full front access maximises system serviceability

Transformerless design

Fully DSP (Digital Signal Processing) controlled

Three-phase UPS delivers the best combination of availability, energy efficiency, overall power performance and lowest total cost of ownership in its class.

Offering both intelligent energy management and maximum power protection it uses less energy, achieves significant cost reductions, saves on valuable floor space (leaving room for revenue-earning equipment) and has a reduced impact on the environment.



Highest load availability

- Productivity maximised
- Reliability maximised
- Availability maximised

The PowerWAVE 6000 incorporates redundant critical circuits (RCC) to effectively eliminate all single points of failure, and provide class-leading system reliability and load availability. PowerWAVE 6000 UPS can be paralleled up to 5 MVA, accommodating even the highest levels of load availability and/or redundancy.

Improved input performance

- Low input harmonic distortion (THDi)
- Near unity input power factor
- Reduced installation costs

PowerWAVE 6000 manages the Total Input Harmonic Distortion (THDi) at a low level (3.5% at 100% load). It does this by neutralising the emission of harmonics at the input of the UPS. Low harmonic distortion saves unnecessary oversizing of generators, cabling and ancillary equipment (such as circuit breakers), avoids extra heating of input transformers (thus wasting less energy) and extends the lifetime of all input components.

High efficiency is further enhanced by removing any requirement for additional phase compensating devices.

Flexible batteries

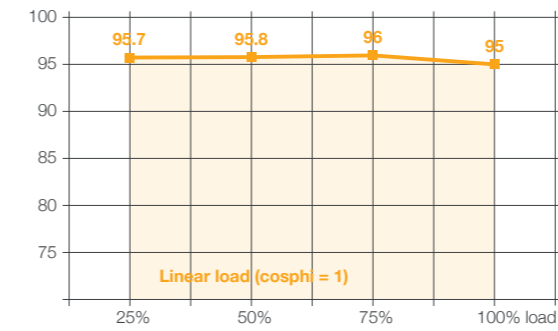
- Bespoke configuration
- Extended battery life
- Front access for ease of installation and servicing

PowerWAVE 6000 allows the freedom to tailor the battery installation to the requirements of the critical load at the lowest possible cost. By adding external battery cabinets, it enables each battery configuration to match the required autonomy, ensuring smallest system footprint and easy usability.

Running costs are further reduced by ripple-free and temperature controlled chargers that protect batteries and extend life-time performance. Front access also aids easy installation and servicing.

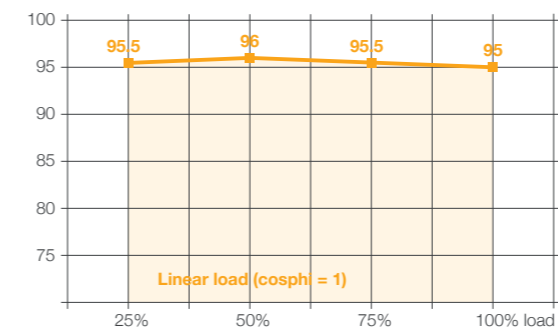
Understanding efficiency and power

AC-AC efficiency (60–120)



Top-of-market 96% efficiency in double conversion mode reduces running costs without compromising reliability. This UPS has a very flat efficiency curve so high efficiency is reached at low load levels.

AC-AC efficiency (160–500)



With a transformerless design and Energy Saving Inverter Switching (ESIS) technology, the PowerWAVE 6000 delivers high efficiency at partial and full load (up to 96% in double conversion online mode). This level of efficiency dramatically reduces the total cost of ownership of the UPS system during its life cycle.

In addition to lower operating costs, the PowerWAVE 6000 extends the service life of components, thereby greatly increasing overall power performance.

Product range

60–120 kVA



Dimensions
W x H x D (mm)

615 x 1954 x 480
Footprint: 0.3m²

160–200 kVA



Dimensions
W x H x D (mm)

850 x 1820 x 750
Footprint: 0.64m²

250–300 kVA



Dimensions
W x H x D (mm)

1100 x 1920 x 750
Footprint: 0.82m²

400–500 kVA



Dimensions
W x H x D (mm)

1650 x 2094 x 850
Footprint: 1.4m²

Blade friendly

- Supports high powered servers such as blade servers
- Supports leading power factors

Blade servers typically have a leading power factor and this can present problems to those UPS systems that are not designed to manage such loads. The PowerWAVE 6000 is designed to power all types of electrical loads, including high-powered servers. It can provide fully rated output power to power factors from 0.9 leading to 0.9 lagging.

Space saving

- Reduced footprint
- Valuable floor space maximised

PowerWAVE 6000's class-leading power density (up to 363kW/m²) is driven by the UPS's small physical footprint of 0.3m² up to 120 kVA, 0.64m² up to 200 kVA, 0.82m² up to 300 kVA, and 1.4m² up to 500 kVA. As a result, substantial and valuable space savings are achieved even at the highest power ratings.

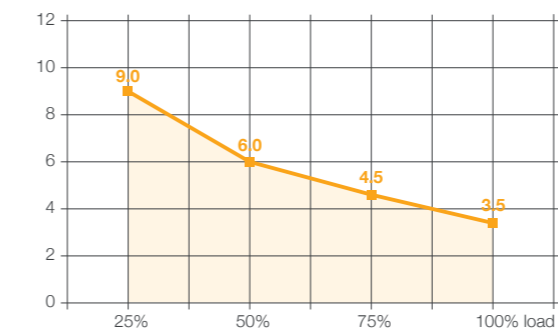
For data centres in particular, this helps to maximise floor space for revenue-earning servers.

Connectivity

- Multiple interface options
- Supports monitoring and control

PowerWAVE 6000 is equipped with multiple interfaces that can be used for local and remote monitoring, status signalling, control, maintenance and firmware upgrade.

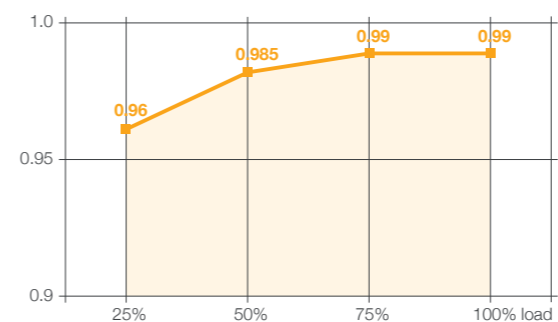
Input current total harmonic distortion (THDi)



The PowerWAVE 6000 actively manages the input current total harmonic distortion (THDi) at a low level (3.5% at 100% load). PowerWAVE's unique technology neutralises the emission of harmonics at the input of the UPS system, providing greater reliability of operations for circuit breakers and extending the overall service life of the equipment.

Low harmonic distortion saves unnecessary oversizing of gensets, cabling and circuit breakers, avoids extra heating of input transformers and extends the overall service life of all upstream components.

Input power factor versus load



Thanks to the near-to-unity input power factor of 0.99, the PowerWAVE 6000 reduces the input installation costs by enabling the use of smaller cables. Furthermore, it avoids the unnecessary use of additional phase compensating devices, which consequently keeps the overall UPS efficiency high.

PowerWAVE 8000DPA (10-200 kVA)

Modular UPS designed for low and medium power applications.

Key benefits

Individual static switches per module

Each module has its own display and controller

Each module has its own control logic

Separate or common battery configuration

Ideal for low to medium, high-density critical power protection applications.

Three-phase UPS built for low to medium, high-density power protection applications. Leading-edge modular design using proven decentralised parallel architecture (DPA) technology. The PowerWAVE 8000DPA offers incredible energy efficiency, 99.9999% availability and flexible scalability in either a tower or rack-mountable solution.

PowerWAVE 8000DPA

Capacities from 10 kVA to 200 kVA in 10 kVA or 20 kVA modular steps

Paralleable frames up to 400 kW

Available as tower (ST) or 19" rack-mountable (RI) solutions

Fully rated output power (blade friendly); 20 kVA = 20kW

N+1 redundancy up to 180 kVA N+1

'Six nines' (99.9999%) availability

Up to 95.5% efficiency across a wide load range

Near unity input power factor at partial and full loads (PF=0.99 @ 100% load)

Low input harmonic distortion (THDi<3%)



The right solution
PowerWAVE 8000DPA is available in two versions

PowerWAVE 8000DPA ST (tower) is available for high-density applications requiring a standard power protection solution including frame, UPS, battery and communication. This solution delivers power protection from 10 kVA to 200 kVA (180 kVA N+1) in 10 kVA or 20 kVA modular steps to provide a maximum power density of 472 kW/m². PowerWAVE 8000DPA cabinet can be paralleled horizontally to increase the capacity up to 400 kW.

The PowerWAVE 8000DPA RI (19" rack-mountable) solution includes UPS, battery and communication, which can be integrated into any 19" rack (independent of manufacturer) and provides up to 80 kVA (60 kVA N+1) making it ideal for integrated IT, telecom or other applications.

Advanced Decentralised Parallel Architecture (DPA)

- Distributed control and power
- Independent hot-swap modules
- No single points of failure

Decentralised Parallel Architecture (DPA) means each UPS module contains all the hardware and software required for full-system operation. They share no common components so a DPA parallel system offers extremely high availability. In addition, potential single points of failure are eliminated and system uptime is maximised. PowerWAVE 8000DPA UPS modules can be paralleled to provide redundancy (parallel redundancy) or to increase the system's total capacity.

Easy to replace 'hot-swap' modules

- Replace or add modules with no downtime
- Cost effective scalability & 'right sizing'
- Simple power upgrade
- Future proof investment

True 'hot-swap' modularity enables the safe removal and/or insertion of UPS modules into a PowerWAVE 8000DPA system without risk to the critical load and without the need to either transfer the critical load onto raw mains or remove power from the critical load. This directly addresses today's requirement for continuous uptime, reducing mean time to repair (MTTR).

High reliability

- Reliability maximised
- Automatic parallel redundant operation

Parallel redundant (N+1) UPS systems provide the highest level of reliability by ensuring that the number of UPS modules in a system is a minimum of one (N) over and above the number required (N) to fully support the critical load.

The PowerWAVE 8000DPA is designed to automatically operate as a parallel redundant system, ensuring that the critical load always receives the highest level of power protection.

Blade friendly

- Supports blade servers
- Supports leading power factors

Blade servers typically have a leading power factor, which can present problems to UPS systems, particularly if they are not designed to power such loads. The PowerWAVE 8000DPA is designed to power all types of electrical loads, including blade servers. It can provide fully rated output power to power factors in the range of 0.9 leading to 0.8 lagging.

Generator friendly

- Generator compatible
- Soft start – introduces the generator load in steps

The PowerWAVE 8000DPA offers a highly effective solution when introducing a generator to the critical load. If the load exceeds 50 per cent of the generator's standby rating, switching the load in a single step presents a number of dangers. To negate this, each of the 'hot-swap' modules within the PowerWAVE 8000DPA's modular frame come equipped with 'soft start' capability. This allows the modules to be switched on sequentially, introducing the generator to the load in more manageable steps.

PowerWAVE 8000DPA ST (tower)

- Up to 10 UPS modules
- Customer inputs and volt-free outputs
- RS232 serial interface
- Maintenance bypass switch
- Slot for optional SNMP card
- AC input terminals
- AC output terminals
- Battery terminal rail



PowerWAVE 8000DPA RI (19" rack-mountable)

- UPS modules
- Internal battery storage
- RS232 serial interface
- Customer inputs and volt-free outputs
- Maintenance bypass switch
- Slot for optional SNMP card
- Battery fuses



**Class-leading energy efficiency
– low total cost of ownership**

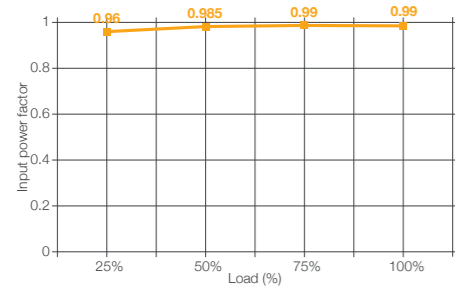
Very high operating efficiency

Reduced installation and upgrade costs

Near unity input power factor and low input (THDi) – reduces running costs

The PowerWAVE 8000DPA delivers class-leading efficiency of up to 95.5% across a wide load range significantly reducing system running costs and site air conditioning costs.

Input power factor versus load (Leading)



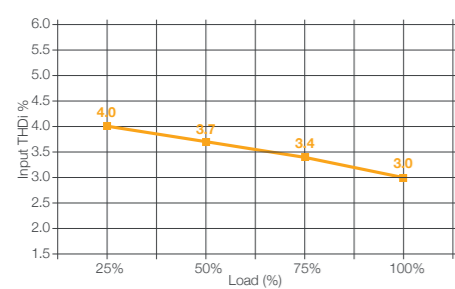
Additionally, PowerWAVE 8000DPA has a near unity input power factor at full load (and even partial loads) reducing the size of the input cable and fuses, thereby saving on materials and costs.

Input current total harmonic distortion (THDi) of less than 3% virtually eliminates harmonic pollution of the mains supply. This saves unnecessary oversizing of gen-sets, cabling and circuit breakers; avoids extra heating of input transformers; and extends the overall lifetime of all input components.

All these benefits ensure that the PowerWAVE 8000DPA offers one of the lowest 'total cost of ownerships' and smallest carbon footprints of any UPS system in its class.

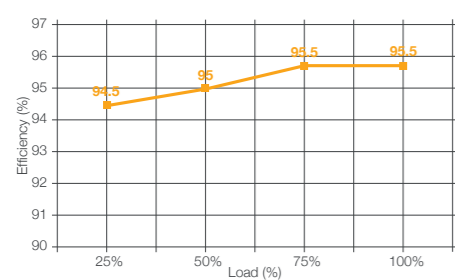
PowerWAVE 8000DPA has a near unity input power factor at full load (and even partial loads) reducing the size of the input cable and fuses, thereby saving on materials and costs.

Input current distortion THDi



Input current total harmonic distortion (THDi) of <3% virtually eliminates harmonic pollution of the mains supply.

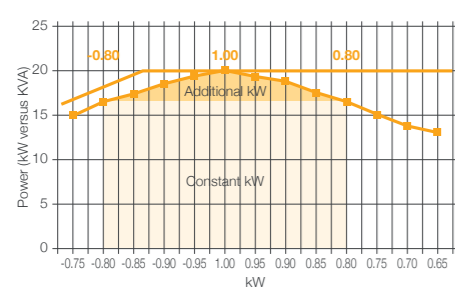
Reduced TCO – AC-AC efficiency



The PowerWAVE 8000DPA's 95.5% true online efficiency significantly reduces system running costs and site air-conditioning costs. This helps reduce the organisation's carbon footprint.

*Depending on configuration.

Blade server friendly power



Designed to power all types of electrical loads including blade servers, the PowerWAVE 8000DPA can provide fully rated output power from 0.9 leading to 0.8 lagging.

*Depending on configuration.

PowerWAVE 8000DPA ST

ST tower range – 10-200 kVA

2 modules – ST 40



Dimensions WxHxD:
550 x 1135 x 775 mm

No. of internal batteries:
2 x 40 x 7.2/9Ah
Total 80 blocks

4 modules – ST 80



Dimensions WxHxD:
550 x 1135 x 775 mm

External battery ONLY

3 modules – ST 60



Dimensions WxHxD:
550 x 1975 x 775 mm

No. of internal batteries:
3 x (2x40) x 7.2/9Ah
Total 240 blocks

6 modules – ST 120



Dimensions WxHxD:
550 x 1 975 x 775 mm

External battery ONLY

10 modules – ST 200



Dimensions WxHxD:
550 x 1975 x 775 mm

External battery ONLY

PowerWAVE 8000DPA RI

19" rack-mountable range – 10-80 kVA

With batteries

RI 11



Dimensions WxHxD:
488 x 487 x 735 mm (11 HU)

Number of batteries: 40

RI 12



Dimensions WxHxD:
488 x 665 x 735 mm (15 HU)

Number of batteries: 80

RI 22



Dimensions WxHxD:
488 x 798 x 735 mm (18 HU)

Number of batteries: 80

RI24



Dimensions WxHxD:
488 x 1153 x 735 mm (26 HU)

Number of batteries: 160

Without batteries

RI 10



Dimensions WxHxD:
488 x 310 x 565 mm (7 HU)

RI 20



Dimensions WxHxD:
488 x 440 x 565 mm (10 HU)

RI 40



Dimensions WxHxD:
488 x 798 x 735 mm (18 HU)

PowerWAVE 9000DPA (30-250 kVA)



Designed to meet the requirements of today – and tomorrow.

Key benefits

- Individual static switches per module
- Each module has its own display and controller
- Each module has its own control logic
- Separate or common battery configuration

Delivers class-leading 'six nines' (99.9999%) power availability.

A revolutionary rack-mounted uninterruptible power supply designed with 'hot swap' modules for future scalability. A transformerless UPS system with class-leading 'six nines' (99.9999%) power availability for demanding IT environments and data centres.

PowerWAVE 9000DPA

Up to 250 kVA (200 kVA N+1) in a single frame

Parallelable up to 1.5 MVA

Transformerless technology

96% true online efficiency

Near unity power factor at parallel and full loads (0.99% @ 100% load)

Low input harmonic distortion (THDi<3%)

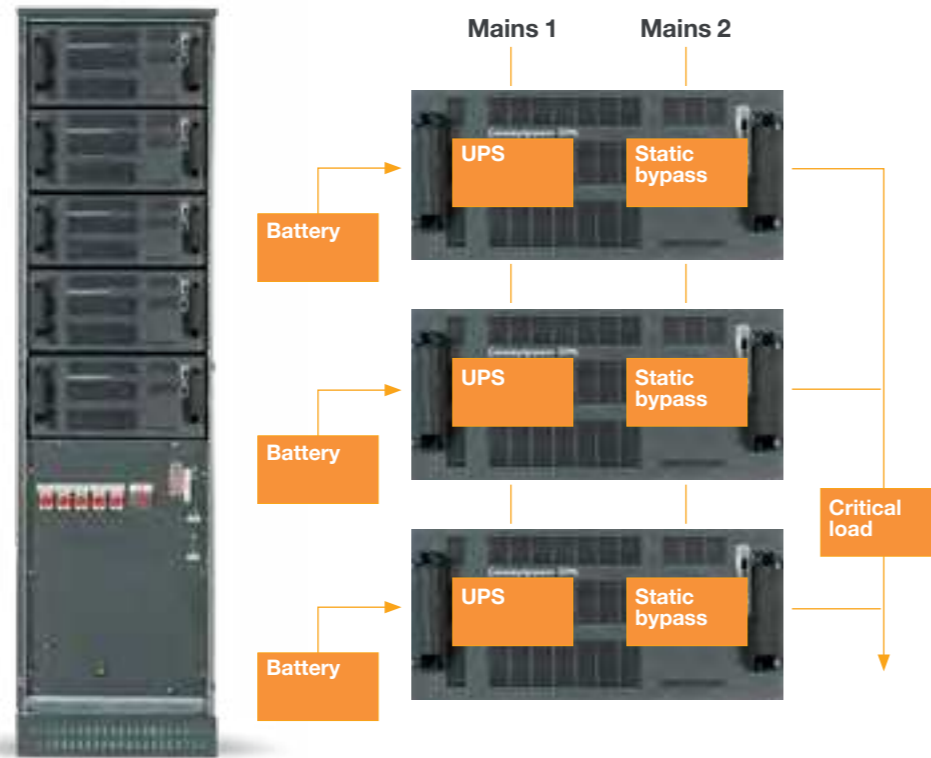
Fully rated output power (blade friendly)

Online double conversion technology

Low total cost of ownership



In today's 'on demand' world, highly reliable power protection systems are essential to the protection of critical data and to ensure 24/7 availability for business applications.



Smallest footprint saves space

- Extremely high power density
- Uses less valuable floor space

Class-leading power density of 342kW/m² significantly minimises the floor space required to accommodate the PowerWAVE 9000DPA. This is particularly important in data centres where space must be maximised to accommodate revenue-earning equipment.

Maximum availability

Six nines availability 99.9999%

PowerWAVE 9000DPA maximises availability by combining the benefits of decentralised parallel architecture, parallel redundancy and 'hot-swap' modularity with low MTTR.



Advanced decentralised parallel architecture (DPA)

- Distributed control and power
- Independent hot-swap modules
- No single points of failure

Decentralised parallel architecture (DPA) means each UPS module contains all the hardware and software required for full system operation. They share no common components, so a DPA parallel system offers extremely high availability. In addition, potential single points of failure are eliminated and system uptime is maximised. PowerWAVE 9000DPA UPS modules can be paralleled to provide redundancy (parallel redundancy) or to increase the system's total capacity.

Easy to replace 'hot-swap' modules

- Replace or add modules with no downtime/no risk
- Simple power upgrade

True 'hot-swap' modularity enables the safe removal and/or insertion of UPS modules into a PowerWAVE 9000DPA system without risk to the critical load and without the need to either transfer the critical load onto raw mains or remove power from the critical load. This directly addresses today's requirement for continuous uptime, reducing mean time to repair (MTTR).

Future proof installation

Investment protection

Future proof installation is assured with the PowerWAVE 9000DPA's scalability and ability to supply the most demanding of modern loads.

High reliability

- Reliability maximised
- Automatic parallel redundant operation

Parallel redundant (N+1) UPS systems provide the highest level of reliability by ensuring that the number of UPS modules in the system is a minimum of one over and above the number required (N) to fully support the critical load. The PowerWAVE 9000DPA is designed to automatically operate as a parallel redundant system, ensuring that the critical load always receives the highest possible level of power protection.

Low cost of ownership

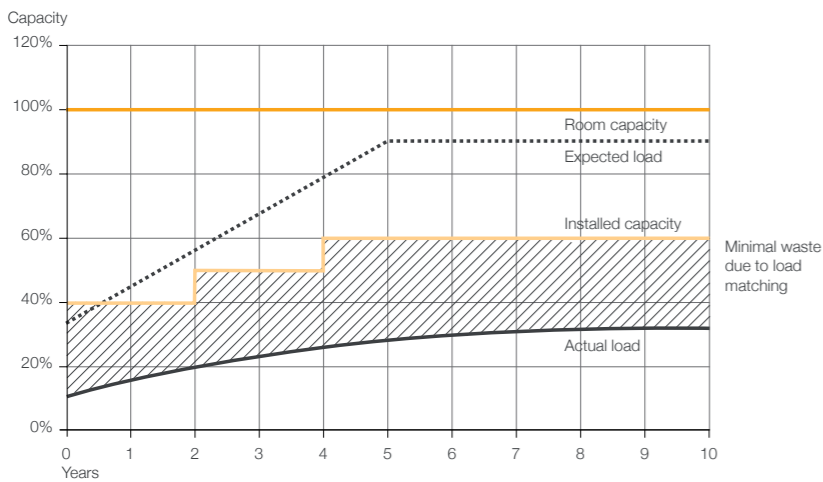
- High operating efficiency, regardless of loading
- Reduced installation and upgrading costs
- Near unity input power factor and low input THDi

By delivering energy efficiency, scalable flexibility and ergonomic design, the PowerWAVE 9000DPA offers a low total cost of ownership and easy serviceability.

Blade friendly

- Supports blade servers
- Supports leading power factors

Blade servers typically have a leading power factor, which can present problems to UPS systems, particularly if they are not designed to power such loads. The PowerWAVE 9000DPA is designed to power all types of electrical loads, including blade servers. It can provide fully rated output power to power factors in the range of 0.9 leading to 0.8 lagging.



Right sizing

Cost-effective scalability

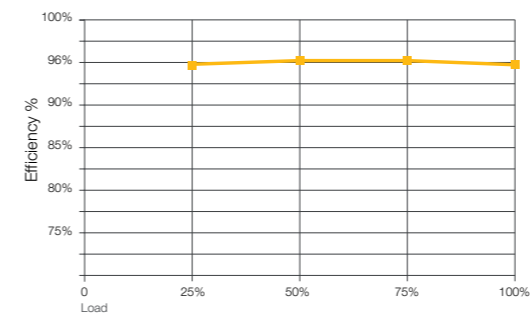
Ability to 'right size' the system over time

Simple installation of new modules

UPS modules can be added in cost-effective incremental steps as the critical load power requirement grows. This 'right sizing' reduces initial cost, optimises operating efficiency and helps reduce total cost of ownership.

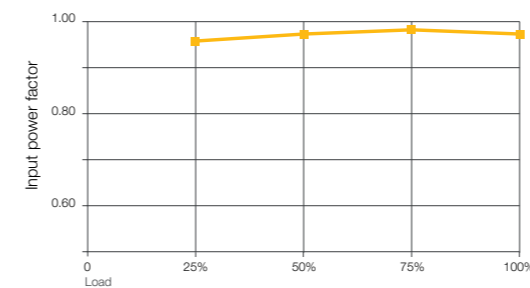
Up to five UPS modules can be paralleled in a single rack-format cabinet to enable up to 200kW (342kW/m²) of power capacity per cabinet, providing 'vertical scalability'. If more capacity is required, cabinets can be paralleled providing 'horizontal scalability'.

AC- AC Efficiency



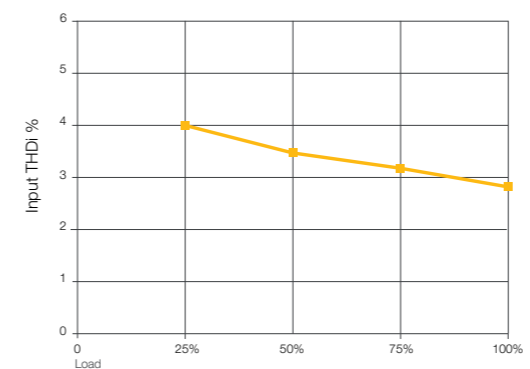
The PowerWAVE 9000DPA's 96% true online efficiency, significantly reduces system running costs and site air-conditioning costs. This helps reduce the organisation's carbon footprint.

Input power factor



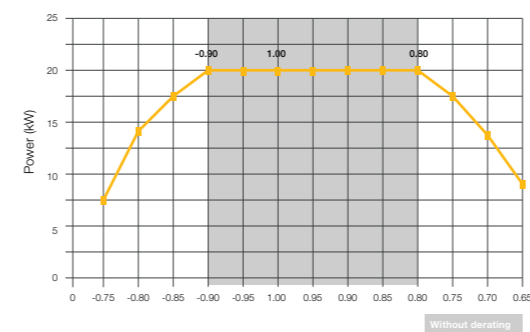
Near unity input power factor, at partial and full load, reduces the required size of the input cable and fuses, thereby reducing the materials (and costs) associated with the system's electrical installation.

THDi



Input current total harmonic distortion (THDi) of <3% virtually eliminates harmonic pollution of the mains supply.

Leading/Lagging



Fully rated output power in the range of 0.9 leading and 0.8 lagging

PowerWAVE 9500DPA (100-500 kVA)

500 kW modular UPS, designed with high efficiency and maximum flexibility at its core.

Total vertical and horizontal scalability using hot swap modularity.

Key benefits

- Individual static switches per module
- Each module has its own display and controller
- Each module has its own control logic
- Separate or common battery configuration

PowerWAVE 9500DPA boasts the lowest total cost of ownership in its class through a combination of high energy efficiency, scalability and ergonomic design.

A class-leading online energy efficiency of up to 96% significantly reduces system running and cooling costs, helping to reduce the organisation's carbon footprint. Further energy savings can be made by operating the PowerWAVE 9500DPA in eco-mode, which increases the efficiency to $\geq 99\%$.

The UPS can be 'right sized' to optimise the power required to match the critical load and modules can be added incrementally as the load increases. This means that you only power and cool what you need, saving power usage over the life of the UPS.

Additionally, PowerWAVE 9500DPA has a near unity input power factor at full load reducing the size of the input cable and fuses, thereby saving on materials and costs. Input current total harmonic distortion (THDi) of less than 3.5% virtually eliminates harmonic pollution of the mains supply. This saves unnecessary oversizing of gen-sets, cabling and circuit breakers, avoids extra heating of input transformers and extends the overall lifetime of all input components.

PowerWAVE 9500DPA

- Up to 96% true online efficiency
- Eco-mode efficiency $\geq 99\%$
- Cost effective scalability to 'right size' system
- Unity power factor and low input THDi
- Up to 500 kW (400 kW N+1) in a single frame
- Scalable to 3 MW
- Transformerless technology
- Hot swappable 100 kW modules
- Up to 96% true online efficiency
- Eco-mode efficiency $\geq 99\%$
- Low total cost of ownership
- 99.9999% (six nines) availability
- Small footprint / High power density
- Unity power factor (kW = kVA)
- Low input harmonic distortion (THDi $<3.5\%$)
- Top and bottom cable entry
- Graphical touchscreen system display

Dimensions and clearances

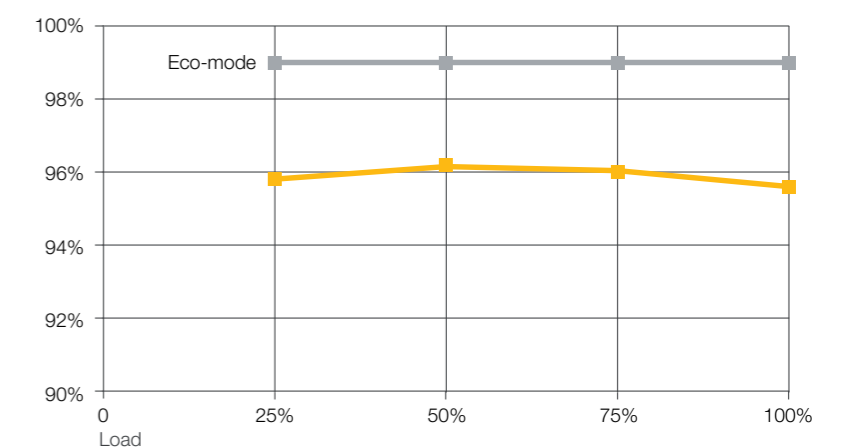
Dimensions

- Width = 1580mm
- Height = 1975mm
- Depth = 945mm
- 1.49m² footprint
- Weight (with 5 modules) = 975 kg

Minimal clearances

- Front 1000mm
- Back 300mm (air outlet)

AC/AC Efficiency with linear, resistive load



High efficiency reaching 96.1%
Flat curve → 95.8% at 25% load

Hot swappable modules

Replace or add modules with no downtime

Simple power upgrade

Future proof investment

True 'hot-swap' modularity enables the safe removal and/or insertion of UPS modules into a PowerWAVE 9500DPA system without risk to the critical load and without the need to either transfer the critical load onto raw mains or remove power from the critical load.

Modules can be replaced or added without any system downtime. Simple power upgrades are therefore possible as the critical load power requirements grow. Additionally, modules can easily be removed for service or replaced if faulty without compromising the availability of the system.



Hot swappable module



Graphical touchscreen system display

Six nines availability

99.9999% availability

By combining the benefits of decentralised parallel architecture, parallel redundancy and hot swap modularity, PowerWAVE 9500DPA has a high mean time between failure (MTBF) and a much reduced mean time to repair (MTTR). This delivers six nines availability – a highly desirable quality required by data centres in pursuit of zero downtime.

Advanced decentralised parallel architecture (DPA)

Distributed control and power

Independent hot-swap modules

No single points of failure

Decentralised parallel architecture (DPA) means each UPS module contains all the hardware and software required for full system operation. They share no common components so a DPA parallel system offers extremely high availability. In addition, potential single points of failure are eliminated and system uptime is maximised. UPS modules can be paralleled to provide redundancy (parallel redundancy) or to increase the system's total capacity.

Graphical touchscreen display

System level display

Individual module displays

The 7" colour touchscreen display provides a clear overview of the UPS at a system level. Graphical and intuitive, the display provides easy navigation to drill down on the performance and status of the individual modules within the system. Additionally, each module has its own display.

PowerWAVE 9500DPA UPS 500 kW

500 kW



Vertical scalability



Top cable entry

Smart connection interface

Inbuilt maintenance bypass switch

Individual module isolator

Inbuilt backfeed protection

Bottom cable entry

Scalable up to 3 MW

Vertical and horizontal scalability

Cost effective 'right sizing'

PowerWAVE 9500DPA can be scaled vertically in 100 kW modular steps to provide up to 500 kW of power in a single frame. This enables power to be added as requirements grow, without the impact on footprint. Horizontal scalability is also possible, with up to 6 frames in parallel, to increase total power up to 3 MW. This two-dimensional scalability means that there is no need to overspecify the original configuration, as modules and/or frames can be added to optimise the power requirements and increase/decrease power to meet future requirements.

Space saving

Small physical footprint

High power density

Minimal air-flow clearance required

PowerWAVE 9500DPA frame has just a 1.49m² footprint, delivering a power density up to 335 kW/m². The UPS also requires minimal front and back clearances. Floor space in data centres can be maximised for revenue earning servers.

Scalable up to 3 MW

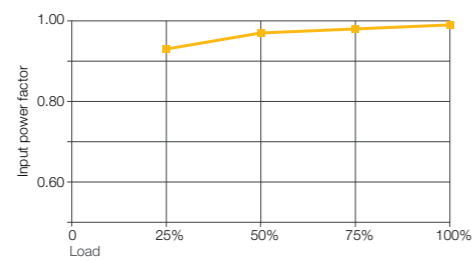
Vertical scalability:
one to five modules in one single cabinet



Horizontal scalability:
six cabinets in parallel configuration up to 3 MW

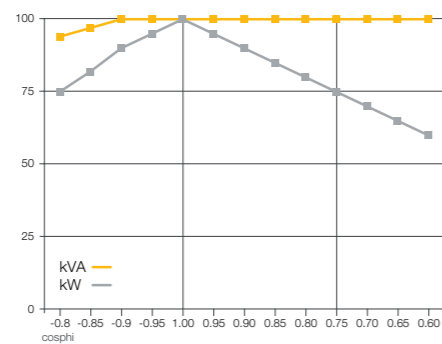
Input and output characteristics

Input power factor



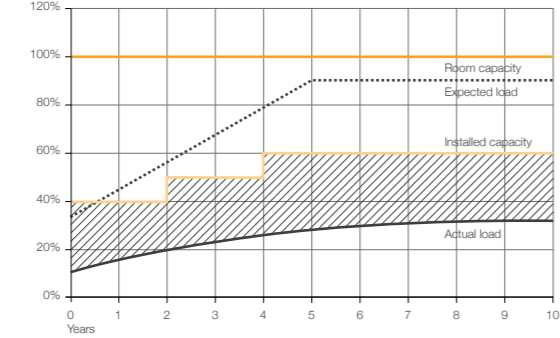
No derating in the range 0.9 leading to 0.6 lagging

Power vs Power Factor



Near unity input power factor, at partial and full load, reduces the required size of the input cable and fuses, thereby reducing the materials (and costs) associated with the system's electrical installation.

Capacity



Minimal waste due to load matching



PowerWAVE Generators

Single and three-phase standby generators.

24/7 standby power.

Total power protection solutions

No longer simply a back-up plan, critical power protection is an essential requirement of every business. If critical applications must be available at all times, without downtime, then a standby generator is the only practical source for long-term power protection during an extended mains outage.

Part of the Kohler Company's Global Power Group, UPS Ltd leverages Kohler's technical leadership in the global generator industry to provide a comprehensive range of standby diesel generators to deliver reliable power when it's needed most.

PowerWAVE generators

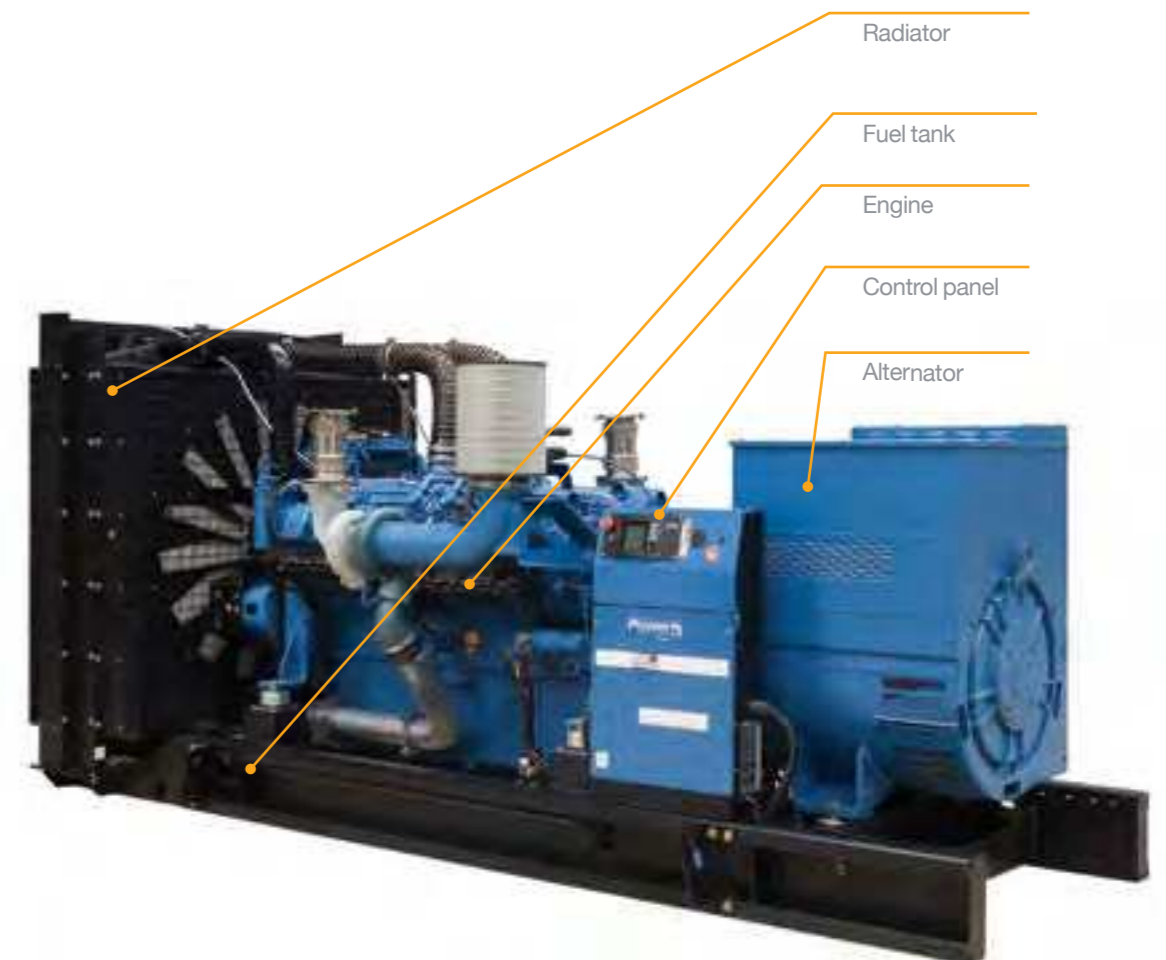
Standby generators for total power protection

Integrated PowerWAVE Generators and UPS systems

Fully matched solutions for true, 'no-break', total power protection

Single source installation, technical support and service

A truly turnkey, one-stop-shop for standby power





Standalone generator

Whether it's a standalone generator or a generator and UPS combined as a total standby power solution, UPS Ltd supplies products engineered to the highest specifications for today's commercial environments.

The PowerWAVE generator brand stands for high reliability, low cost and durability. Whether you buy a single generator or a complete solution, all products have the backing of comprehensive technical support, commissioning and maintenance services with excellent service delivery.

One-stop-shop – installation and services 'turnkey' solution

UPS Ltd's turnkey UPS and generator package guarantees both systems are fully matched, which ensures a true no-break supply in the event of a power failure. Turnkey supply and project management ensures the correct sizing of the generator set with respect to the UPS and critical load. Our fully trained service engineers will test the complete installation to verify system integrity, removing the problem of demarcation between different suppliers.

Reliability and durability

PowerWAVE generators are highly reliable. We only supply products that we know are going to be with you a long time, which will never fail to provide you with back-up power whenever you need it. PowerWAVE generators offer leading-edge control panel technology, versatility, durability, operation and maintenance. Weatherproof enclosures, for example, and protective coverings for vital parts, reduce wear and tear and aid longevity.

PowerWAVE Generators
Single and three- phase standby
generators. 24/7 standby power.

Acoustic enclosures

Noise compliant to latest EC directive
2000/14/EC
Integral bunded fuel tanks

UPS Ltd's range of acoustic enclosures has been designed to withstand even the harshest and most extreme climate conditions. Their compact design has been developed specifically to save space and costs – a plus for today's streamlined business environments. They are highly transportable, easy to install and due to their integrated cooling system, sound attenuation and silencers are completely self-contained.

Bulk fuel tanks

Environment Agency PPG02 compliant
Content gauges and overflow alarms

'Bunding', in a fuel tank, minimises the risk of spillage and offers total security alongside compliance with Environment Agency PPG02 regulations for the storage of diesel fuel. We can provide a wide range of bunded fuel tanks, ready to use. All our tanks are available in different specifications, depending on customer and site requirements. The correct installation of bunded fuel tanks is just as important as the quality of the tank itself. Using single or double-skinned pipework, our team of experts install and test bunded fuel tanks to ensure they are fully compliant with applicable regulations and in complete working order.

Bespoke acoustic packages

Plantroom attenuation
Acoustic enclosures / containers

Every installation is different and some require bespoke acoustic engineering. At UPS Ltd, we've made it our business to design solutions around the customer and this is evidenced by our ability to customise acoustic packages that include container design, plantroom design, groundworks, mechanical installation, cabling, pipework and associated works required to meet the exact requirements of the installation.

All sets available open or canopied.

PowerWAVE T series

Single phase (8–17 kVA)
Three phase (11–22 kVA)

Powerful series of standby generators available in 6 models for single and three-phase business applications. Each generator is built with a high performance Mitsubishi engine for reduced noise pollution and improved fuel efficiency. Available as an 'open' generator or within an acoustic enclosure to further minimise noise emissions. Standard and DW24 tank options.

PowerWAVE J series

Three phase (22-250 kVA)

Series of three-phase UPS generators providing power from 22 to 250 kVA. Each generator is powered by a John Deere engine for reliable backup during power failures. Bunded fuel tank minimises diesel spillage, with additional fuel tank capacity to extend run time. Models available for commercial and industrial use. Standard, DW24 and DW48 tank options.

PowerWAVE V series

Three phase (275-700 kVA)

High specification range of UPS generators providing 'turnkey' backup power with TELYS control panels fitted as standard. Each generator is powered by a Volvo engine. Built-in fault-finding tools and remote operation for a reliable power supply during mains failures. Available 'open' or within a weatherproof enclosure for added protection from the elements. Standard and DW24 tank options.

PowerWAVE D series

Three phase (275-830 kVA)

Power products generating set, equipped with a DOOSAN engine. Standard and DW24 tank options.



APM 303 control panel

- Entry level control panel
- LCD screen for basic engine and alternator operational parameters
- LED alarm and fault indication

Our entry level product is the APM 303 panel. APM 303 is fitted as standard on all PowerWAVE T and J series standby generators. It provides both manual and automatic operational control of the generator and provides a basic indication of operational parameters, as well as alarm and fault indication via its standard LCD screen. Additionally, LED indication of alarms and faults are also provided.



TELYS control panel

- Advanced control panel
- Simplified operation
- Large backlit LCD makes engine/alternator parameters easy to read
- Built-in fault-finding tool
- Enhanced communication
- Integrated maintenance monitoring programme

The more advanced TELYS panel offers enhanced operational user-friendliness and a diagnostics capability. The combination of its large backlit LCD screen and its ability to adjust the contrast to ambient light conditions makes operational parameters easy to read. Additionally, the generator can be controlled and operating parameters viewed remotely – without the need to install specific software – via USB, Ethernet or RS485 ports. TELYS also has a built-in fault-finding tool for fault or alarm diagnosis. TELYS is fitted as standard on the PowerWAVE V series of generators, but can be factory fitted in place of the APM 303 to provide enhanced capability to the PowerWAVE T and J series generators.

Your choice of control

Most generators supplied by UPS Ltd have a choice of control panel options. Generators these days are extremely reliable with almost all enabling both automatic and manual operation. The choice of an appropriate control panel is therefore down to how much additional monitoring is desired. A more advanced control panel offers enhanced user-friendliness and diagnostics capability. It does all this with a reduced number of buttons, thus simplifying operation.

Changeover panels

UPS Ltd provide a choice of two high quality automatic changeover panels – the VERSO 100 and 200 – to enable automatic start-up of the standby generator and safe, fast transfer of the load in the event of a mains power cut. When mains power is restored, these changeover panels will automatically disconnect the generator and connect the load back to the mains.

The VERSO 100 is rated for applications from 35 to 160 amp.

The VERSO 200 is rated for higher applications from 200 to 1600 amp and has the additional benefit of an LCD, allowing the voltage and frequency parameters on both the mains and generator sides to be simultaneously displayed.



PowerWAVE EL

(Single phase 500 VA – 30 kVA)
Three phase 10-160 kVA)



Efficient power for emergency lighting and safety equipment.

Addresses the need for a range of high performance static inverters manufactured using state-of-the-art technology to give your operation the peace of mind it needs.

Boasting true double-conversion and PWM technology, the entire range is capable of 120% continuous overload and has optional parallel modes. UPS Ltd's most intelligent battery monitoring maximises service life and a galvanic isolation transformer is included as standard.

PowerWAVE EL

Designed to the latest European EN 50171

True double-conversion and PWM technology

Inverter stage output galvanic isolation transformer included

Capable of 120% continuous overload to meet European emergency lighting regulations

Parallel mode operation (optional) (hot standby, redundant, symmetric parallel)

Large charger for faster recharge of batteries

Maintenance bypass (for complete isolation of the inverter during maintenance)

Unique inverter design to suit high inrush lighting loads

Bypass to load (changeover mode) user selectable

LCD panel providing accurate detailed information about load, batteries and inverter with advanced diagnostics

RS232 and dry contacts for communication and remote monitoring





Common applications

- Emergency lighting systems
- Central power supply systems
- Fire alarm and safety systems
- System and battery test function
- Hospital and medical systems
- Cinemas and entertainment venues
- Retail

PowerWAVE EL 100XA series

High performance static inverter (500-3000VA)

- Wall-mounted and standalone options
- Allows for an internal self-contained battery system capable of supplying standard emergency lighting of 3 hour autonomies
- Fully encapsulated product for lower rated requirements
- High reliability with low maintenance
- Low operating cost
- Wide range of standard ratings available
- Battery options to suit all applications
- Intelligent battery monitoring to maximise service life
- Simple & easy to install with front access

PowerWAVE EL 100 series

Single-phase input and output online static inverter (4-12 kVA)

- Solution for higher power, single-phase loads
- Galvanic isolation transformer at the inverter stage
- High reliability with low maintenance
- Low operating cost
- Wide range of standard ratings available
- Battery options to suit all applications
- Intelligent battery monitoring to maximise service life
- Simple & easy to install with front access



PowerWAVE EL 200 series

Three-phase input and single-phase output static inverter (10-30 kVA)

- Solution for higher power, three-phase loads
- Galvanic isolation transformer at the inverter stage
- High reliability with low maintenance
- Low operating cost
- Wide range of standard ratings available
- Battery options to suit all applications
- Intelligent battery monitoring to maximise service life
- Simple & easy to install with front access

PowerWAVE EL 300 series

Three-phase input & output static inverter (10-160 kVA)

- Solution for higher power, three-phase loads
- Galvanic isolation transformer at the inverter stage
- High reliability with low maintenance
- Low operating cost
- Wide range of standard ratings available
- Battery options to suit all applications
- Intelligent battery monitoring to maximise service life
- Simple & easy to install with front access





Battery design, installation and continuous care.

Pioneering solutions for total power protection.

The battery plays a key role in the overall reliability and availability of a power protection system. It supplies the energy required by the critical load in the event of a mains utility failure or when the input mains voltage and frequency are outside the acceptable values. Moreover, the battery represents an important share of the total cost of the UPS, and therefore battery care and management are of paramount importance when a UPS is designed.

UPS Ltd provides a range of remote monitoring and diagnostics services to provide early fault detection and prevention. PowerNSURE is the most advanced monitoring product on the market today.

Battery services

Advice on battery system design

'Made to measure' battery installation service

Battery impedance testing to track battery condition

Inspection, cleaning and maintenance options to ensure battery working life is optimised

Battery replacement programme for a wide range of battery supported products

Safe battery disposal

Monitoring and regulation of batteries to extend battery life and prevent unexpected failure using PowerNSURE

Monitoring

PowerNSURE battery monitoring

PowerREPORTER remote UPS monitoring

HawkEye2™ generator monitoring

SNMP onsite monitoring



Inspection, cleaning and maintenance

Regular maintenance optimises the working life of a battery installation and ensures early detection of weak or faulty battery blocks. If not replaced, a compromised battery would threaten the integrity of the whole power protection system. Routine battery maintenance provided by our skilled team of specialist engineers includes:

- Checking the open circuit battery and UPS float voltages
- Inspecting the physical condition of batteries, terminals and connections
- Environmental checks – ambient temperature of battery room
- Checking the cleanliness of equipment
- Assessing the condition of battery cabinets
- Performing a detailed examination of individual cells for post and interconnector corrosion
- Taking voltage readings – block and string voltages

Replacement and upgrade

We supply and fit batteries of all types into all models of UPS and secure power systems. Additionally, UPS Ltd offers a battery replacement programme for a wide range of battery supported products. These include AC UPS, DC equipment, emergency lighting units and generator starting batteries.

Disposal

Batteries are classed as hazardous waste and, in the UK, must be disposed of in line with the Hazardous Waste Regulations 2005. As a registered carrier of such waste (registration number TWE/675610), UPS Ltd ensures that all the legal requirements associated with the removal, transportation and disposal of waste batteries are fully complied with.

Quality guaranteed

Our quality assurance, health and safety and environmental procedures are BSI EN ISO 9001:2008, OHSAS 18001 and ISO 14001 certified. We are also certified under the SafeContractor scheme (www.safecontractor.com). These certificates ensure that all of your obligations under health and safety legislation are fully met. All battery maintenance visits and activities are fully documented.

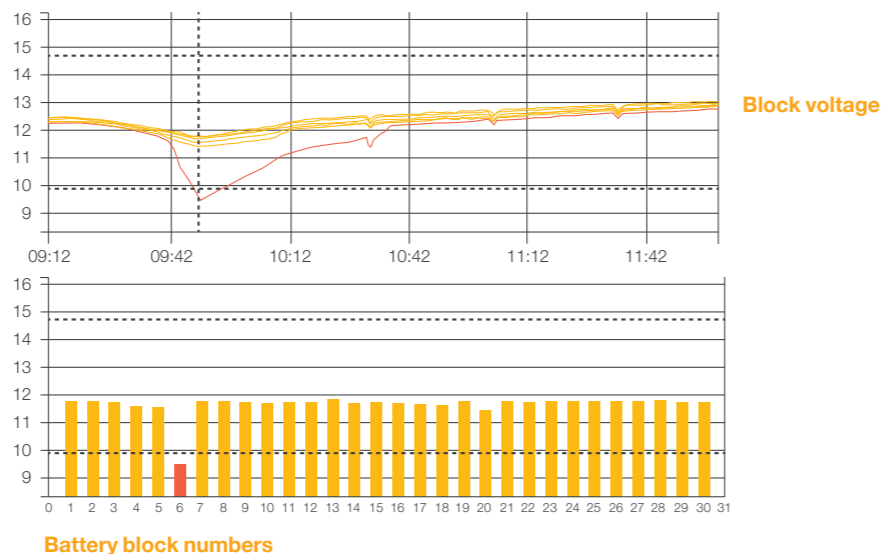
Impedance testing

Our impedance testing provides a means of assessing the internal condition of batteries. Almost any battery problem will lead to an increase in internal impedance. Recorded at regular intervals, impedance testing will track battery condition and enable end-of-working-life prediction. This service is included as part of the PowerNSURE system or can be purchased separately.

PowerNSURE

- Extends battery life by equalisation
- Monitors and regulates the battery charging process and avoids undercharging
- Indicates battery problems before failure
- Monitors condition of every battery individually including temperature

The PowerNSURE system from UPS Ltd is the most advanced product on the market today, providing an ethernet-network integrated battery monitoring and management system. Using web-management technology, it checks the internal resistance, temperature and voltage of every single battery sequentially. Through the equalisation process, the system corrects the charging voltage operating range. This prevents gassing, dry-out and thermal runaway. The constant monitoring and controlling of the individual charging voltages for each battery guarantees the availability of the battery at all times.



PowerNSURE reporting

The reporting system displays the status of all lead-acid batteries. Any change in impedance, temperature and voltage is displayed and stored. Reports can be run regularly on site, enabling constant monitoring of the system using the PowerNSURE viewer. Through regular monitoring of key parameters, the system will provide a warning when attention is required.

The graph above demonstrates that battery 6 is weak after 30 minutes of discharge into a 45-minute run. This early warning system enables the user to replace the weak performing battery and thus increase the lifetime of the complete battery system.





24-hour remote monitoring service for UPS systems.

Benefits

- Continuous monitoring and management of your UPS
- Ideal for mission-critical systems and unmanned sites
- Alarm-triggered interrogation of UPS parameters for remote diagnosis
- Prevention and early fault detection
- Dedicated UPS Ltd Support Centre – manned 24/7/365 to ‘collect, assess and respond’
- Combined with a maintenance contract, PowerREPORTER improves service levels, enabling engineer to arrive onsite with the correct spares
- Complete assurance of continuous availability

A ‘virtual’ power engineer on your site 24 hours a day.

Total power protection solutions

PowerREPORTER is specifically designed to ensure your business’ critical load is protected by dedicated, trained personnel, even when your facility is unmanned.



How PowerREPORTER works

PowerREPORTER communicates constantly with your UPS system in order to automatically detect any error or alarm messages. In the event of an incident being detected, PowerREPORTER automatically connects with UPS Ltd's Service Centre network via email, transmitting a status message and providing any available details relating to the fault, as well as a device identification string.

UPS Ltd's Service Centre personnel are then able to liaise with the company's field service team who can interrogate and manage the UPS, performing all necessary remote diagnostics before reaching the facility within the contracted service agreement timeframe.



Your fully customised monitoring solution

Installation and maintenance of your power surveillance system

Email connectivity

Real-time email notification sent in response to alarm/critical events directly to UPS Ltd Support Centre

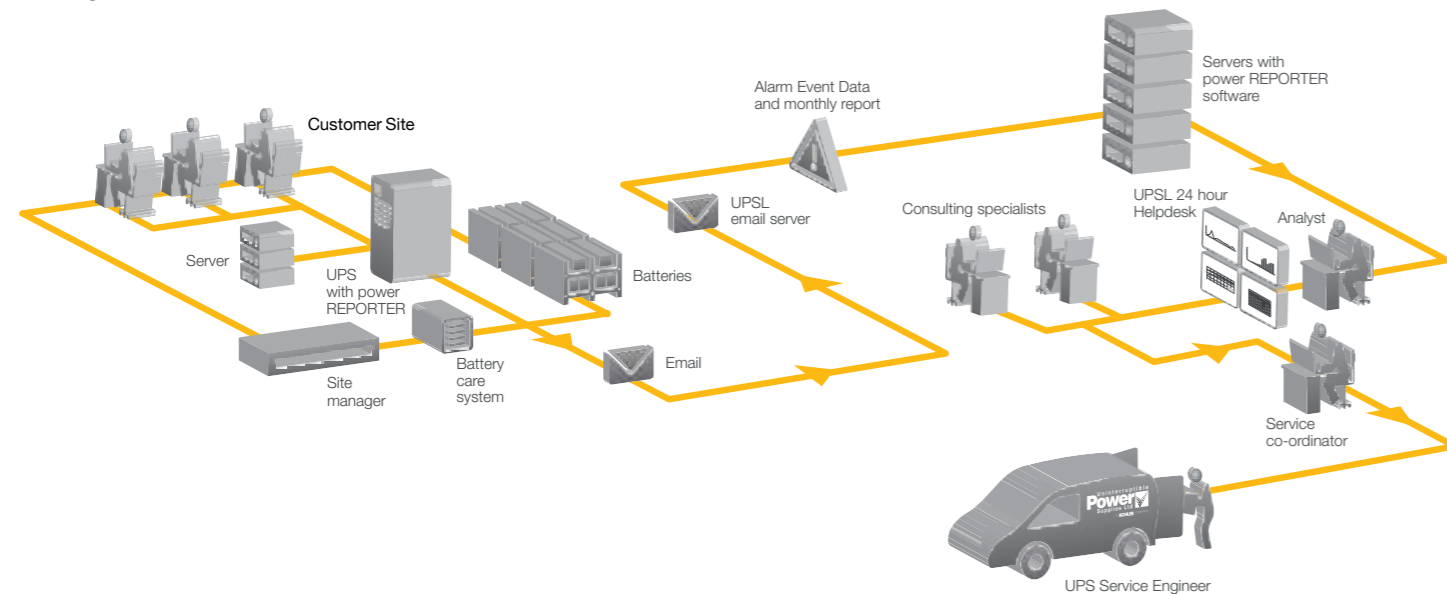
Monthly UPS Ltd status report detailing trends and alarms

Optional battery monitoring via PowerNSURE – measuring battery parameters to help prevent battery failure

"PowerREPORTER provides valuable eyes and ears in our server room during weekends, out of hours and unmonitored periods with engineer backup. We have previously been called by the engineer, out of hours, and the problem rectified before the next working day. PowerREPORTER communicates securely and further provides the capability for us to monitor the system's web front-end, plus it has a remote power-off capability."

A London-based Hedge Fund organisation

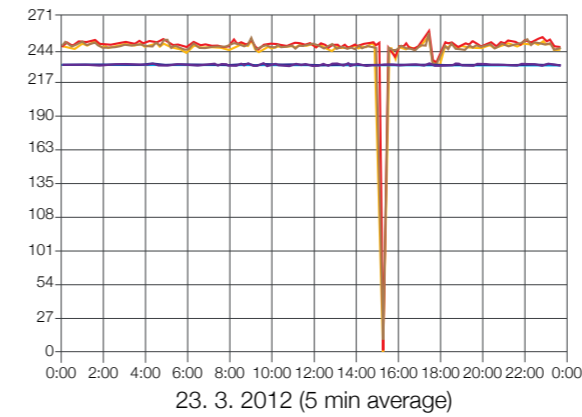
PowerREPORTER Specifically designed to ensure your business' critical load is protected by dedicated, trained personnel, even when your facility is unmanned.



Monthly UPS Ltd Status Report

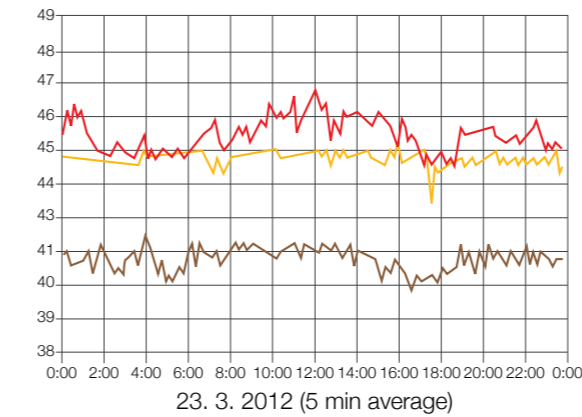
Example screenshots of power outages from a client site.

Input and output voltage



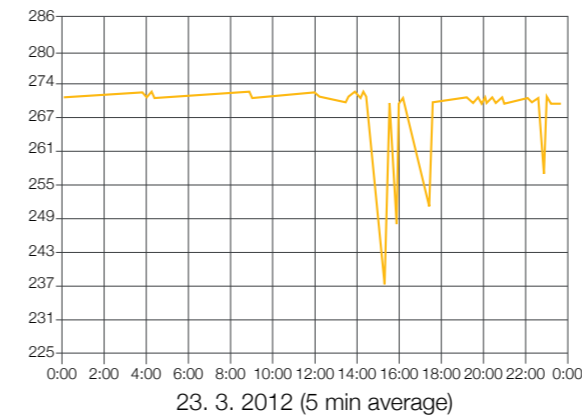
The input voltage data on this graph clearly shows the first major power cut. The output voltage is unaffected and steady on all 3 phases throughout.

Load



This graph demonstrates how the load was supplied throughout the mains failures.

Battery voltage



This graph clearly shows the battery voltage discharge and recovery as the charger returns after each mains failure.

Flexible service plans,
load bank testing,
UPS and generator rental.

Service solutions

Maintenance

- UPS maintenance contracts
- Generator maintenance contracts

Batteries

- Battery replacement and upgrade
- Load bank testing
- Impedance testing
- PowerNSURE battery monitoring
- Battery disposal

Monitoring

- PowerNSURE battery monitoring
- PowerREPORTER remote UPS monitoring
- HawkEye2 generator monitoring
- SNMP onsite monitoring

Onsite

- Site survey
- Installation & commissioning
- Black building testing
- Load bank testing
- UPS relocation and disposal

Pioneering solutions for
total power protection.

At UPS Ltd, our core business is the design, installation and maintenance of secure power protection systems. Delivered by our trained engineers and support staff, we offer the most comprehensive and cost-effective service plans available ensuring your power protection systems are expertly maintained on a regular basis and ready to support your business load.



UPS maintenance contracts

UPS Ltd's maintenance plans offer the flexibility to choose the level of service needed to ensure that risks and costs are minimised. They all provide regular maintenance visits and you can choose the level of service time you need to suit your business requirements. To maximise the reliability of your UPS, a service plan from UPS Ltd also ensures critical component degradation is identified and that repairs or replacements are carried out before a fault occurs. Immediate spares availability is assured through our extensive spares inventory.

Features

Routine inspection and preventative maintenance

Emergency call-out options including guaranteed speed of response, 24 hours a day, 365 days a year

Remote monitoring (optional)

Battery maintenance

Fully comprehensive cover available

Key benefits

Comprehensive plans competitively priced optimising UPS availability – with no unscheduled budgetary surprises

Guaranteed response times to site – we're there when we say we'll be there

24/7 telephone support for an instant response to your service needs

Extensive network of trained field service engineers

Service for a wide range of UPS brands

Support contracts tuned precisely to each installation, so you only pay for the service level you need

Remote monitoring options to complement telephone support

Extensive spare parts inventory ensuring maintenance and repairs are carried out without delay

Generator maintenance contracts

UPS Ltd offers a comprehensive and cost-effective range of service plans to ensure your standby generator is ready to perform when it is needed most. Our standby generator service plans cover all key components including engine, alternator, control system, fuel, exhaust, cooling and air handling systems.

Since generators are usually inoperative for long periods, regular service is needed to ensure that they are fully functional and able to supply power when required. All our service plans offer the flexibility to choose the level of service needed to ensure that risks and costs are minimised. They all provide regular maintenance visits and you can choose the level of response time you need to suit your business requirements.

Features

Inspection and cleaning

Electrical, hydraulic and lubricant checks

Engine maintenance and repair

Battery checks and maintenance

Fuel checks and replenishment

Oil sampling and changing, air and water filter replacement

24/7 emergency support

Load bank testing (optional)

Identification of critical component degradation

Immediate spares availability

We will communicate with you right through the service process, proactively managing your service visits and organising the best time to visit to minimise any disruption.

All this not only ensures your power protection system will guarantee your business continuity but assures your peace of mind.

Battery replacement and upgrade

We supply and fit batteries of all types into all models of UPS and secure power systems. UPS Ltd also offers a battery replacement programme for a wide range of battery supported products. We can supply a replacement UPS battery compatible with your AC UPS, DC equipment, emergency lighting and generator starting batteries

A key benefit of regular battery maintenance is the early detection of weak battery blocks. As they are such a critical part of a power protection system, replacement of weak battery blocks should therefore take place before they fail. If a UPS replacement battery is not purchased, a weak or faulty battery will compromise the integrity of the whole power protection system.

Impedance testing

Almost any battery problem will lead to an increase in internal impedance. Recorded at regular intervals, impedance testing will track battery condition and enable end-of-working-life prediction for individual cells, so batteries can be replaced before they cause a critical power protection failure

An electrical current is passed through each battery in turn and a measurement taken. The internal impedance of each battery is then calculated, logged in a table and plotted on a graph.

A report will be provided after the batteries have been tested detailing the status of each bank and advising which, if any, will need to be replaced.

This service is included as part of the PowerNSURE system or can be purchased separately.

Load bank testing

Comprehensive commissioning procedures and the regular testing and maintenance of UPS systems and batteries go a long way towards ensuring the integrity of a power protection system. However, there is only one certain way of establishing that all the components of the system will function correctly together and perform as intended when required – load bank testing.

Fully loading the power support system stresses all components. It is clearly preferable to identify potential weaknesses under controlled conditions rather than to wait until the system is supporting a critical load. It is also cost effective to acquire this service and the expertise and experience of a professional specialist service provider.

Load bank testing is the provision and connection of an electrical load to a power supply, often a UPS, in order to simulate the client's load and prove the integrity of the overall system. Load bank testing ascertains the performance of the UPS, and of the entire electrical supply infrastructure including cabling, switchgear, generator and fuses. A load bank can also be used to discharge batteries as an effective, accurate and relatively low cost method of determining battery autonomy.

Key benefits

Mobile AC/DC load banks of any size

Engineer-controlled tests carried out to individual requirements

Battery autonomy and integrity testing

Out-of-hours testing to suit the client's operational requirements

PowerNSURE battery monitoring

The PowerNSURE system from UPS Ltd is the most advanced product on the market today, providing an ethernet-network integrated battery monitoring and management system.

Using web-management technology, PowerNSURE checks the internal resistance, temperature and voltage of every single battery sequentially. Through the equalisation process, the system corrects the charging voltage operating range. This prevents gassing, dry-out and thermal runaway. The constant monitoring and controlling of the individual charging voltages for each battery ensures the availability of the battery at all times.

Battery disposal

We manage the safe and environmental disposal of batteries and replacement UPS batteries in line with Hazardous Waste Regulations. As a registered carrier of such waste, UPS Ltd ensures that all the legal requirements associated with the removal, transportation and disposal of waste batteries are fully complied with.

PowerNSURE battery monitoring and care

All UPS systems rely on the integrity of batteries to protect the critical load in the event of a power failure. To ensure the integrity of your secure power system is not compromised, we provide a comprehensive range of battery services including design installation, maintenance, monitoring, replacement and disposal.

See pages 64–67.

PowerREPORTER remote UPS monitoring

PowerREPORTER is specifically designed to ensure your business' critical load is protected by dedicated trained personnel, even when your facility is unmanned.

See pages 68-71.

SNMP onsite monitoring

Connect your UPS directly to your computer network as a network device with UPS Ltd's SNMP solution. Contact us on 0800 731 3269 for more information.

HawkEye2™ generator monitoring

The all new HawkEye2™ Remote Monitoring System is much more than just a piece of communication hardware fitted to your generator. HawkEye2™ is an industry leading, monitoring, management and fault rectification system integrating the latest GSM communications technology with the best 24/7 generator support personnel anywhere in the world.

Once a week, HawkEye2™ automatically starts your generator and runs it for 10 minutes, checking vital operating parameters such as voltage, frequency, oil and water temperature, battery condition, emergency stop and fuel levels. After the test, a full condition report is sent to the HawkEye2™ monitoring centre via phone line or GSM upload. You can also choose to receive SMS or voicemail reports sent to nominated numbers.

If your standby generators are in action, or you're using prime power generators equipped with HawkEye2™, you get 24-hour monitoring, 365 days a year.

Features include:

Fully automatic operation 24/7

Continuous monitoring of generator conditions

Notification of mains failure and generator operation

Confirmation of a successful test run

Automatic low fuel warning

Based on a common platform, HawkEye2™ can be fitted to new or existing generators and programmed to monitor a huge range of parameters including:

- Electrical – voltage, current, frequency of generator and mains power
- Mechanical – engine data including speed, oil pressure, and temperature
- Physical – location of the generators using the GPS network
- Remote control – test running, fuel levels, alarms and alerts
- Site specific requirements – intruder alarms, fire alarm, etc.



Site survey

UPS Ltd's experienced team of engineers are able to provide a free site survey, to offer you a choice of power protection solutions tailored to your requirements and budget.

The free survey is offered during normal working hours within our service network covers area.

A typical UPS site survey will last around 1-2 hours depending on the size of the installation. Full recommendations and quotations will be provided after the survey has been completed.

UPS Ltd endeavours to assess the following areas during the survey:

- Load size
- Physical location and environment
- Suitability for existing UPS and battery installation
- Delivery route and logistics requirements
- Remote monitoring requirements
- Ongoing maintenance and technical support requirements
- General programme of works and preferred installation timeframe

Installation and commissioning

Both UPS and generators must be properly installed and commissioned to ensure a long and trouble-free working life. Whilst small less sophisticated UPS systems simply plug into a standard mains socket, larger UPS systems – must be electrically installed and commissioned by skilled and qualified professionals. Likewise with generators; larger standby generator systems should be professionally installed and commissioned. Additionally, a generator must be properly matched with all other power equipment for continuous power to be guaranteed.

As a leading generator supplier, our project team will work closely with you, from start to finish, ensuring your UPS and/or generator installation is commissioned safely, on time and with minimal disruption to your business.

Our factory trained, highly skilled field-service engineers will commission and test the complete power protection system. They work in accordance with factory-issued commissioning procedures and written method statements and provide full commissioning certification for warranty validation.

Key benefits

Full project management including site assessment, delivery and positioning

Organisation of any electrical and mechanical work required

Extensive network of trained field service engineers

Certification to BSI EN ISO 9001:2008, environmental procedures ISO 14001, health & safety procedures OHSAS 18001 and SafeContractor scheme

Black building testing

UPS Ltd's trained service engineers can be on hand to monitor your UPS systems during your annual IST (Integrated System Test) black building testing.

Black building tests are normally carried out to test for high availability, performance, business continuity plans and recovery capabilities in a disaster-like scenario. For example, the testing will result in the electrical power to the entire building being shut off imitating a street power outage.

Black building tests tend to be carried out to:

- Simulate a total power failure – leading to a complete power shut-down in a facility
- Test the functionality of generators, simulating a total (external) power outage, replaced by generator-provided energy. This does not touch any equipment except generators, thus not causing any disruption to systems

Why is the test important?

Equipment loss of power can result in compromised:

- Safety
- Product and equipment protection
- Comfort
- Staff convenience

Key benefits

UPS Ltd offers skilled and qualified engineers to attend site during the test period to monitor the UPS systems

Fully documented, procedures ensuring full traceability of all test events and actions

'Safe method of work' covering the power down and power up of a UPS and/or generator

UPS Ltd's ISO procedures and certifications assure quality of service and compliance with health and safety legislation

Load bank testing

Comprehensive commissioning procedures and the regular testing and maintenance of UPS systems and batteries go a long way towards ensuring the integrity of a power protection system. However, there is only one certain way of establishing that all the components of the system will function correctly together and perform as intended when required – load bank testing.

Fully loading the power support system stresses all components. It is clearly preferable to identify potential weaknesses under controlled conditions rather than to wait until the system is supporting a critical load. It is also cost effective to acquire this service and the expertise and experience of a professional, specialist service provider.

Load bank testing is the provision and connection of an electrical load to a power supply, often a UPS, in order to simulate the client's load and prove the integrity of the overall system.

Load bank testing ascertains the performance of the UPS, and of the entire electrical supply infrastructure including cabling, switchgear, generator and fuses. A load bank can also be used to discharge batteries as an effective, accurately and relatively low cost method of determining battery autonomy.

Key benefits

Mobile AC/DC load banks of any size

Engineer-controlled tests carried out to individual requirements

Battery autonomy and integrity testing

Out-of-hours testing to suit the client's operational requirements

UPS relocation and disposal

Relocation

If you have a requirement for a UPS to be relocated either to a different room within the same building or to a brand new location, UPS Ltd can assist you.

The relocation of a UPS involves the decommissioning, safe transportation and recommissioning of the UPS, associated batteries and electrical switchgear. Using trained engineers and our highly experienced logistics team, UPS Ltd can assist with this. Should you require help with the associated electrical works, we can accommodate this using one of our electrical contractor service partners.

UPS disposal

If you have a requirement to dispose of a UPS, UPS Ltd can assist with a wide range of UPS brands.

Using trained engineers and our highly experienced logistics team, we can carry out the disposal of the UPS and associated batteries. Our engineer will ensure that the UPS is safely decommissioned ready for our logistics team to pack and palletise the UPS and batteries for transportation and disposal in line with Special Waste Regulations 1996 legislation.



Technical Specifications

MINIpowerPLUS

All models											
Input voltage (nominal)	230V										
Input frequency	50/60Hz ±2% autosensing										
Input voltage range	184 to 264V at 100% load 100 to 264V at 50% load										
Input power factor	>0.99 at 20% load										
Input current total harmonic distortion	<3%										
Output voltage	230V ± 1%										
Output frequency	50/60Hz synchronised										
Overload capacity											
Online Modes	150% for 30s, 200% for 5s, 300% for 1s										
Battery Modes	160% for 15s										
Protection degree	IP 21										
Standards	EN62040-1, EN50091-2, EN62040-3										
Batteries	3 x 12V 9 Ah sealed lead-acid, maintenance-free batteries per board (standard) Up to several hours available on request										
MINIpowerPLUS tower											
	5000					10000					
Rated power (kVA)	1.25	2.5	3.75	5	5	6.25	7.5	8.75	10		
Active power (kW)	0.875	1.75	2.625	3.5	3.5	4.375	5.25	6.125	7		
Dimensions (mm) WxDxH	270 x 475 x 570				270 x 475 x 570						
Weight (kgs)	23.5	34	43	53	24	26.5	29	31.5	34		
Battery	Internal (external optional)				External (additional cabinets)						
MINIpowerPLUS rack											
	5000										
Rated power (kVA)	1.25	2.5	3.75	5							
Active power (kW)	0.875	1.75	2.625	3.5							
Dimensions (mm) WxDxH	483 x 266 x 582		(6 U)								
Weight (kgs)	23.5	34	43	53							
Battery	Internal (external optional)										

PowerWAVE 1000

Model	1 kVA	2 kVA	3 kVA
Input			
Voltage window	120/140/160-288 (33%, 66%, 100% load)		
Frequency	50/60Hz ±5Hz (auto sensing)		
Phase	Single phase		
Power factor	>0.99 (full load)		
Output			
Voltage (vac)	200/208/220/230/240		
Voltage regulation	< +/-1% until low battery warning		
Capacity	1000VA / 700W	2000VA / 1400W	3000VA / 2100W
Power factor	0.7 Lagging		
Wave form	Sine wave, THD<3% (no load to full load)		
Frequency stability	+/-0.1% unless synchronized to line		
Frequency regulation	±3Hz or 1Hz (setting by software) when synchronised to line		
Transfer time inverter to bypass	2.5 ms	0 ms	
Crest factor	3:1		
Efficiency (AC to AC) full load	85%		88%
Autonomy (built-in battery)	>7 min		>5 min
DC start	Yes		
Battery			
Type	Sealed lead acid maintenance free		
Capacity	7Ah	9Ah	
Quantity (pcs)	3	6	
Built-in charger (max charging current)	1.8A	2.1A	2.7A
Display			
LED	Normal, battery, bypass, programmable outlet 1, programmable outlet 2, self-test, battery weak & bad, site wiring fault, fault, overload, and load/battery level conditions		
Key	On button / off button (test/alarm silence button)		
Self-diagnostics	Upon power on and software control		
Protection			
Overload AC mode & backup mode (delay before switching to bypass)	<105% continuously. >106%-120% for 30 seconds transfer to bypass. >121%-150% for 10 seconds transfer to bypass. >150% immediately transfer to bypass. Buzzer continuously alarms		
Epo	UPS shuts down immediately		
Battery	Advanced battery discharge management (ABDM)		
Alarms			
Audible & visual	Line failure, battery low, overload, system fault conditions		
Physical			
Dimensions WxHxD (mm)	440x88x405	440x88x650	
IEC/local 230Vac	6 x IEC320-C13 10A		4 x IEC320-C13 10A & 1 x IEC320-C19 16A
Net Weight (Kg)	15.1	28.2	29.8
Environment			
Operating temperature	0°C – 40°C		
Altitude	0-2000m up to 40°C / 3000m up to 35°C		
Humidity	90% RH maximum, non-condensing		
Environment – heat dissipation (approx)	150W	275W	415W
Noise	< 50dB (at 1 meter)		
Computer interface			
Interface type	Standard RS232 and USB interfaces		
Communication slots	Relay contact board, SNMP card		
Compatible platforms	Windows 95/98/NT/2000/XP/Vista, Novell NetWare, Linux		
Safety conformance			
Quality assurance	ISO9001 Certified Company		
Safety standard	EN62040-1-1, IEC60950-1		
Performance	EN62040-3 complied		
EMC standard	EN62040-2, EN61000-3-2, EN61000-3-3, FCC class A		
Marks	CE, UL, cUL, FCC		

PowerWAVE 1000

Model	4.5 kVA	6 kVA	8 kVA	10 kVA
Input				
Voltage	160 – 280Vac – line to neutral			
Frequency	45-65 Hz			
Phase	Single phase			Single or three phase
Power factor	Up to 0.99 @ 100% linear load			
Current THDi	<6% @ 100% linear load single phase/<30% 3 phase			
Output				
Voltage	200/208/220/230/240 vac selectable			
Voltage regulation	+/-2%			
Capacity	4500VA/4050W	6000VA/5400W	8000VA/7200W	10000VA/9000W
Rated power factor	0.9 lagging			
Wave form	Sine Wave, THD <3% (no load to full linear load)			
Frequency stability	+/-0.2% on inverter free-running mode			
Frequency regulation	+/-1Hz, +/-3Hz (programmable by user) when synchronised to line			
Transfer time inverter to bypass	0 ms			
Crest factor	3:1			
Efficiency (AC to AC, normal)	Up to 91%			
Efficiency (AC to AC, ECO)	Up to 92%		Up to 93%	
DC start	Yes			
Battery				
Type	Sealed lead acid maintenance free			
Capacity	12V/9AH		12V/9AH	
Quantity	20 pcs			
Display				
Status on LED + LCD	Line mode, backup mode, ECO mode, bypass supply, battery low, battery bad/disconnect, overload, transferring with interruption, and UPS fault			
Readings on LCD	Input voltage, input frequency, output voltage, output frequency, load percentage, battery voltage, and inner temperature			
Self-diagnostics	Upon power-on and front panel setting			
Alarms				
Audible and visual	Line failure, battery low, transfer to bypass, system fault condition			
Protection				
Overload	Inverter supply: sliding scale: 105% 160sec, 150% 40ms, >150% switch to bypass			
Physical				
Dimensions WxHxD (mm)	445x222x680		445x267x680	
Input/output connection	Hardwire			
External battery connection	Plug-in & play			
Net Weight (Kg)	24.0		26.0	
Environment				
Operating temperature	0°C to 40°C			
Altitude	0-2000m up to 40°C / 3000m up to 35°C			
Humidity	90% RH maximum, non-condensing			
Environment – heat dissipation (approx)	450w	500w	600w	700w
Noise	<50dB (at 1m)			
Computer interface				
Interface Type	Standard RS232/EPO interface			
Communication Slots	2nd RS232, USB, RS485, relay contact (DCE-B), SNMP/WEB card			
Safety conformance				
Quality assurance	ISO9001 Certified Company			
Safety standard	EN62040-1-1, UL1778			
EMC standard	IEC/EN 62040-2 class A, IEC/EN 61000-4-2/-3/-4/-5/-6/-8, IEC/EN61000-2-2, IEC/EN 61000-3-2/-3			
Marks	CE, cUL, UL single phase, CE three phase			
Battery bank				
Model	Battery type	Maximum quantity	With batteries (Kg)	Dimension W x H x D (mm)
PWBAT – 9 – 20	9AH	20 pcs	82	445x133x69

PowerWAVE 3000/TP

General data	10 kVA	10 kVA (5 min)	10 kVA (16 min)	20 kVA	20 kVA (5 min)
Output rated power [W]	9 kW			18 kW	
Output power factor	0.9			0.9	
Topology	True online double conversion			True online double conversion	
Parallel configuration	Up to 4 units			Up to 4 units	
Inbuilt batteries	No	Yes	Yes	No	Yes
Input					
Nominal input voltage	1ph + N: 220 / 230 / 240 VAC 3ph + N: 380 / 400 / 415 VAC				
Input voltage tolerance	1ph -230 V: -23%, +15% 3ph -400 V: -23%, +15%				
Input current THD	< 5% linear load, < 7% non-linear load				
Frequency range	45 - 55 Hz for 50 Hz systems / 55 - 65 Hz for 60 Hz system				
Power factor	0.99				
Output					
Rated output voltage	220 / 230 / 240 VAC				
Voltage tolerance	± 2%				
Voltage distortion	2 % linear load, 5 % non-linear load				
Overload capability (linear load)	5 min: 105 % ~ 110 %, 1 min: 110% ~ 130 %, 10 s: 130 % ~ 150 %, 25 ms: > 150 %				
Nominal frequency	50 or 60 Hz ± 0.1 Hz				
Crest factor	3:1				
Efficiency					
AC-AC	Up to 93.6 %				
In eco-mode	Up to 97 %				
Environment					
Protection rating	IP 20				
Storage temperature	-15 – +60°C for UPS, 0–35°C for battery				
Operating temperature	0 - 40°C				
Relative humidity	0 - 95 % (Non-condensing)				
Altitude (above sea level)	1000 m without de-rating				
Batteries					
Type	VRLA, vented lead-acid				
Inbuilt batteries	-	1x 24	2 x 24	-	2 x 24
Battery capacity	-	9 Ah	9 Ah	-	9 Ah
Charging current	4 A	4 A	4 A	4 A	4 A
Recharge time	-	3 h to 90 %	up to 8 h to 90 %	-	8 h to 90 %
Communications					
User interface	LCD display				
Communication cards (option)	Network interface (SNMP card), dry- contact card (AS400)				
Standards					
Safety	IEC / EN 62040-1				
EMC	IEC / EN 62040				
Performance	IEC / EN 62040-3				
Manufacturing	ISO 9001:2008, ISO 14001:2004				
Weight / Dimensions					
Weight	56 kg	117 kg	177 kg	66 kg	187 kg
Dimensions W x H x D (mm)	350*890*712	350*890*712	350*890*712	350*890*712	350*890*712

PowerWAVE 5000/TP

General data	10 kVA	15 kVA	20 kVA	25 kVA	30 kVA	40 kVA	50 kVA
Topology	True online double conversion						
Parallel configuration	Up to 20 units						
Integral batteries	Yes						
Input							
Nominal input voltage	3 x 380 / 220 V + N, 3 x 400 V / 230 V + N, 3 x 415 / 240 V + N						
Voltage tolerance	(-23%/+15%) 3 x 308/177V to 3 x 460/264V for <100% load						
Input distortion THDi	3.0% @ 100% load						
Frequency range	35 – 70 Hz						
Power factor	0.99 @ 100 % load						
Output							
Output rated power	9 kW	13.5 kW	18 kW	22.5 kW	27 kW	36 kW	45 kW
Output power factor	0.9						
Rated output voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N						
Voltage tolerance	1% static, 4% dynamic						
Voltage distortion	< 2 % with linear load, < 4 % with non-linear load						
Overload capability (0.9 p.f)	10 min: 110% load, 1 min: 130% load						
Nominal frequency	50 or 60 Hz						
Crest factor	3:1						
Efficiency							
AC-AC (@ p.f = 1.0)	Up to 95.5% @ 100% load						
In eco mode	Up to 98% @ 100% load						
Environment							
Protection rating	IP 20						
Operating temperature	0°C – 40°C						
Positional clearances	Front: 900 mm minimum						
	Left: 600 mm minimum						
	Right: 600 mm minimum						
	Rear: 200 mm minimum for cooling, 600 mm minimum for service						
Input & output power cabling accessibility	Cabled at the rear (A & B cabinets only)			-			
	-			Cabled at the front (C cabinets only)			
Relative air humidity	Up to 95% (non condensing)						
Batteries							
Min / Max number of 12V blocks per string*	22 – 50	32 – 50	32 – 50	40 – 50	24 – 50	32 – 50	40 – 50
Charging current	4A				6A		
Battery type	Maintenance free VRLA or NiCd						
Standards							
Safety	IEC/EN 62040-1-1:2003, IEC/EN 60950-1:2001/A11:2004						
EMC	IEC/EN 62040-2:2005, IEC/EN61000-3-2:2000, IEC/EN61000-6-2:2001						
Performance	IEC/EN62040-3:2001						

PowerWAVE 6000

General data	60 kW	80 kW	100 kW	120 kW	160 kW	200 kW	250 kW	300 kW	400 kW	500 kW
Output power max.	60 kW	80 kW	100 kW	120 kW	160 kW	200 kW	250 kW	300 kW	400 kW	500 kW
Output power factor	1.0									
Topology	True online double conversion									
Parallel configuration	Up to 10 units									
UPS type	Standalone									
Cable entry	Bottom front								Bottom front or top	
Inbuilt batteries	Optional									
Input										
Nominal input voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N									
Voltage tolerance (Ref. to 3 x 400 / 230 V)	For loads < 100 % (-23 %, +15 %), < 80 % (-30 %, +15 %), < 60 % (-40 %, +15 %)									
Input distortion THDi	≤ 3.5% at 100 %									
Frequency	35-70 Hz									
Power factor	0.99 at 100 % load									
Output										
Rated output voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N									
Voltage distortion	< 2 %									
Frequency	50 or 60 Hz									
Overload capability	10 min.: up to 125 % or 1 min.: up to 150 %									
Unbalanced load	100 % possible									
Crest factor	3 : 1									
Efficiency										
Overall efficiency	Up to 96 %									
In eco-mode configuration	98 %									
Environment										
Storage temperature	-25-70 °C									
Operating temperature	0-40 °C									
Altitude configuration	1000 m without derating									
Battery										
Battery type	Sealed, lead-acid, maintenance-free or NiCd									
Communications										
Graphical display	Optional								Yes	
Standards										
Safety	IEC / EN 62040-1									
Electromagnetic compatibility (EMC)	IEC / EN 62040-2									
Performance	IEC / EN 62040-3									
Product certification	CE									
Protection rating	IP 20									
Manufacturing	ISO 9001:2008, ISO 14001:2004									
Weight/Dimensions										
Weight (without batteries)	230 kg	240 kg	245 kg	280 kg	290 kg	310 kg	390 kg	410 kg	950 kg	1000 kg
Dimensions W x H x D (mm)	550 x 1820 x 750			850 x 1820 x 750			1100 x 1920 x 750		1650 x 1994 x 850	
Dimensions with battery enclosures W x H x D (mm)	970 (or 1180) x 1820 x 750			-			-		-	

PowerWAVE 8000DPA ST

General data	ST40	ST60	ST80	ST120	ST200
System power range	10–400 kW				
Nominal power per module	10 kW / 20 kW				
Nominal power / frame	40 kW	60 kW	80 kW	120 kW	200 kW
Number of UPS modules	1 to 2	1 to 3	1 to 4	1 to 6	1 to 10
Max. number of inbuilt batteries (7 / 9 Ah)	80	240	–	–	–
Output power factor	1.0				
Topology	Online double conversion				
Parallel configuration	Up to 20 modules (up to 4 frames)				
UPS type	Modular (Decentralized Parallel Architecture)				
Input					
Nominal input voltage	3 × 380 / 220 V + N, 3 × 400 / 230 V + N, 3 × 415 / 240 V + N				
Voltage tolerance (referred to 3 × 400 / 230 V)	For loads <100% (–23%, +15%), <80% (–30%, +15%), <60% (–40%, +15%)				
Input distortion THDi @ 100% load	≤3%				
Frequency	35–70 Hz				
Power factor	0.99				
Output					
Rated output voltage	3 × 380 / 220 V + N, 3 × 400 / 230 V + N, 3 × 415 / 240 V + N				
Voltage distortion (referred to 3 × 400 / 230 V)	<1.5% linear load				
Frequency	50 Hz or 60 Hz				
Overload capability	1 min.: up to 150% / 10 min.: up to 125%				
Unbalanced load	100% (all three phases regulated independently)				
Crest factor	3 : 1 (load supported)				
Efficiency					
Overall efficiency	Up to 95.5%				
In eco-mode configuration	98%				
Environment					
Storage temperature	–25 °C to +70 °C				
Operating temperature	0 °C to +40 °C				
Altitude configuration	1000 m without derating				
Communications					
LCD	Yes (per module); system display optional (graphical touch screen display)				
LEDs	LED for notification and alarm				
Communication ports	USB, RS-232, SNMP slot, potential-free contacts				
Standards					
Safety	IEC / EN 62040-1				
Electromagnetic compatibility (EMC)	IEC / EN 62040-2				
Performance	IEC / EN 62040-3				
Product certification	CE				
Manufacturing	ISO 9001:2008, ISO 14001:2004, OHSAS18001				
Weight/Dimensions					
Weight (with modules / without batteries)	Up to 135 kg	Up to 238 kg	Up to 168 kg	Up to 262 kg	Up to 389 kg
Dimensions (WxDxH) mm	550 × 1135 × 775	550 × 1975 × 775	550 × 1135 × 775	550 × 1975 × 775	550 × 1975 × 775

PowerWAVE 8000DPA RI

General data	RI10	RI11	RI12	RI20	RI22	RI24	RI40
Nominal power per module	10 kW / 20 kW						
Nominal power / frame	20 kW	20 kW	20 kW	40 kW	40 kW	40 kW	80 kW
UPS modules	1	1	1	1 to 2	1 to 2	1 to 2	1 to 4
Maximum number of inbuilt batteries (7 / 9 Ah)	–	40	80	–	80	160	–
Output power factor	1.0						
Topology	Online double conversion						
UPS type	Modular (Decentralized Parallel Architecture)						
Input							
Nominal input voltage	3 × 380 / 220 V + N, 3 × 400 / 230 V + N, 3 × 415 / 240 V + N						
Voltage tolerance (referred to 3 × 400 / 230 V)	For loads <100% (–25%, +15%), <80% (–30%, +15%), <60% (–40%, +15%)						
Input distortion THDi	≤3%						
Frequency	35–70 Hz						
Power factor	0.99						
Output							
Rated output voltage	3 × 380 / 220 V + N, 3 × 400 / 230 V + N, 3 × 415 / 240 V + N						
Voltage distortion	<1.5% linear load						
Frequency	50 Hz or 60 Hz						
Overload capability	1 min.: 150% / 10 min.: 125%						
Unbalanced load	100% (all three phases regulated independently)						
Crest factor	3 : 1 (load supported)						
Efficiency							
Overall efficiency	Up to 95.5%						
In eco-mode configuration	98%						
Environment							
Storage temperature	–25 °C to +70 °C						
Operating temperature	0 °C to +40 °C						
Altitude configuration	1000 m without derating						
Communications							
LCD	Yes (per module)						
LEDs	LED for notification and alarm						
Communication ports	USB, RS-232, SNMP slot, potential-free contacts						
Standards							
Safety	IEC / EN 62040-1						
Electromagnetic compatibility (EMC)	IEC / EN 62040-2						
Performance	IEC / EN 62040-3						
Product certification	CE						
Manufacturing	ISO 9001:2008, ISO 14001:2004, OHSAS18001						
Weight/Dimensions							
Weight (with modules /without batteries)	Up to 39 kg	Up to 62 kg	Up to 78 kg	Up to 68 kg	Up to 109 kg	Up to 136 kg	Up to 136 kg
Dimensions (WxDxH) mm	488 × 310 × 565 (7 HU)	488 × 487 × 735 (11 HU)	488 × 665 × 735 (15 HU)	488 × 440 × 565 (10 HU)	488 × 798 × 735 (18 HU)	488 × 1153 × 735 (26 HU)	488 × 798 × 735 (18 HU)

PowerWAVE 9000DPA

General data

System power range	30–1500 kVA
Nominal power per module	30 kVA / 40 kVA / 50 kVA
Nominal power / frame	250 kVA
Number of UPS modules	1 to 5
Weight (with modules / without batteries)	421–439 kg
Dimensions w x h x d	730 x 1975 x 800 mm
Output power factor	0.8
Topology	Online double conversion
Parallel configuration	Up to 30 modules
UPS type	Modular (Decentralized Parallel Architecture)

Input

Nominal input voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N
Voltage tolerance (referred to 3 x 400 / 230 V)	For loads <100% (-25%, +15%), <80% (-30%, +15%), <60% (-40%, +15%)
Input distortion THDi	≤3% @ 100% load
Frequency	30–70 Hz
Power factor	0.99

Output

Rated output voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N
Voltage distortion (referred to 3 x 400 / 230 V)	<2%
Frequency	50 Hz or 60 Hz
Overload capability	1 min.: up to 150% / 10 min.: up to 125%
Unbalanced load	100% (all three phases regulated independently)
Crest factor	3 : 1 (load supported)

Efficiency

Overall efficiency	Up to 95.5%
In eco-mode configuration	98%

Environment

Storage temperature	-25 °C to +70 °C
Operating temperature	0 °C to +40 °C
Altitude	1000 m without derating

Battery

Battery capacity	Configurable up to several hours
Internal batteries	No

Communications

LCD	Yes (per module)
LEDs	LED for notification and alarm
Communication ports U	SB, RS-232, SNMP slot, potential-free contacts

Standards

Safety	IEC / EN 62040-1
Electromagnetic compatibility (EMC)	IEC / EN 62040-2
Performance	IEC / EN 62040-3
Manufacturing	ISO 9001:2008, ISO 14001:2004, OHSAS18001
Product certification	CE
IP rating	IP 20

PowerWAVE 9500DPA

General data

System power range	100 kW – 3 MW
Nominal power / module	100 kW
Nominal power / frame	500 kW
Output power factor	1.0
Topology	Double conversion, transformer-free, modular, Decentralized Parallel Architecture
Parallel configuration	Up to 5 modules in one frame (500 kW) / up to 6 frames in parallel (3 MW)
Cable entry	Bottom or top as standard
Serviceability	Fully front serviceable
Back-feed protection	Built-in as standard

Input

Nominal input voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N
Voltage tolerance	308–460 V (-10–+15%) < 100% load (-20–+15%) < 80% load, (-34–+15%) < 60% load
Input distortion THDi	< 3.5% at 100% load
Frequency range	45 to 70 Hz
Power factor	0.99 @ 100% load
Walk in / Soft start	Yes

Output

Rated output voltage	3 x 380 / 220 V + N, 3 x 400 / 230 V + N, 3 x 415 / 240 V + N
Output voltage variation	< +/- 1.5
Voltage distortion	< 2% with linear load < 4% with non-linear load
Frequency	50 or 60 Hz (selectable)

Efficiency

AC-AC	Up to 96%
In eco-mode	≥ 99%

Environment

Protection rating	IP 20
Storage temperature	-25° – +70°
Operating temperature	0° – +40°C
Altitude (above sea level)	1000 m without de-rating

Batteries

Number of 12V blocks / string	Flexible number from 40 – 50 blocks
Types	VRLA, vented lead-acid, NiCd
Battery charger	Decentralized charger per module

Communications

User interface	Graphical touch screen (one per frame as standard) Decentralized LCD + mimic diagram (one per module as standard)
Communication ports	USB, RS-232, voltage-free contacts, SNMP (optional)
Customer interface	Remote shutdown, gen-set interface, external bypass contact

Compliance

Safety	IEC / EN 62040-1
EMC	IEC / EN 62040-2
Performance	IEC / EN 62040-3
Manufacturing	ISO 9001:2008, ISO 14001:2004

Weight/Dimensions

Weight	Approx. 975 kg (500 kW system without batteries)
Dimensions WxHxD	1778 x 1975 x 914 mm

Canopied units

T Series generating sets from 8.6 kVA to 17 kVA (single phase) or 11.5 to 22kVA (three phase) with weatherproof/acoustic enclosure

Single-phase (230V) Mitsubishi engine	Standby rating kVA (0.8pf)	Base tank options	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load	Acoustic pressure level dB(A) @ 1m
T9KM	8.6	Standard day tank (50L)	1750 x 775 x 1230	544	16	20	71
		DW24 tank option (93L)	1797 x 775 x 1391	625	30	37	71
T12KM	12	Standard day tank (50L)	1750 x 775 x 1230	630	11	14.5	72
		DW24 tank option (93L)	1797 x 775 x 1391	668	21	27	71
T17KM	17	Standard day tank (100L)	2080 x 960 x 1415	820	16	21	70
		DW24 tank option (230L)	2160 x 966 x 1582	1010	37	48.5	70
Three-phase (400/230V) Mitsubishi engine	Standby rating kVA (0.8pf)	Base tank options	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load	Acoustic pressure level dB(A) @ 1m
T12K	11.5	Standard day tank (50L)	1750 x 775 x 1230	530	16	20	71
		DW24 tank option (93L)	1797 x 775 x 1391	615	30	37.5	71
T16K	16	Standard day tank (50L)	1750 x 775 x 1230	554	11	14.5	72
		DW24 tank option (93L)	1797 x 775 x 1391	633	21	27	71
T22K	22	Standard day tank (100L)	2080 x 960 x 1415	780	16	21	70
		DW24 tank option (230L)	2160 x 966 x 1582	970	37	48.5	70

V Series generating sets from 275 kVA to 700 kVA with weatherproof/acoustic enclosure

Three-phase (400/230V) Volvo engine	Standby rating kVA (0.8pf)	Base tank options	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load	Acoustic pressure level dB(A) @ 1m
V275C2	275	Standard day tank (390L)	4004 x 1380 x 2145	3130	7	9	78
		DW24 tank option (950)	4056 x 1380 x 2340	3850	17.5	22	77
V350C2	350	Standard day tank (470L)	4475 x 1410 x 2430	4035	7	9.5	77
		DW24 tank option (1368L)	4527 x 1410 x 2700	4558	21.5	28	80
V400C2	390	Standard day tank (470L)	4475 x 1410 x 2430	4082	6.5	8.5	77
		DW24 tank option (1368L)	4527 x 1410 x 2700	4612	19	25.5	80
V440C2	440	Standard day tank (470L)	4475 x 1410 x 2430	4080	5.5	7	78
		DW24 tank option (1368L)	4527 x 1410 x 2700	4740	16	21.5	81
V500C2	500	Standard day tank (470L)	4475 x 1410 x 2430	4360	5	6.5	78
		DW24 tank option (1368L)	4527 x 1410 x 2700	4910	14.5	19.5	81
V550C2	550	Standard day tank (500L)	5031 x 1560 x 2435	4870	4.5	6.5	76
		DW24 tank option (1770L)	5083 x 1560 x 2700	5590	17	23.5	76
V650C2	650	Standard day tank (610L)	5031 x 1690 x 2672	5300	5	7	80
		DW24 tank option (1950L)	5083 x 1690 x 2932	5910	16.5	22.5	80
V700C2	700	Standard day tank (610L)	5031 x 1690 x 2672	5410	4.5	6	85
		DW24 tank option (1950L)	5083 x 1690 x 2932	6140	13.5	18.5	85

Based on manufacturer's information, may be subject to change.

Canopied units

J Series generating sets from 22 kVA to 250 kVA with weatherproof/acoustic enclosure

Three-phase (400/230V) John Deere engine	Standby rating kVA (0.8pf)	Base tank options	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load	Acoustic pressure level dB(A) @ 1m
J22	22	Standard day tank (100L)	2080 x 960 x 1415	980	14	20	75
		DW24 tank option (230L)	2160 x 966 x 1582	1160	32.5	46	74
		DW48 tank option (420L)	2160 x 966 x 1631	1124	60	84	74
J33	33	Standard day tank (100L)	2080 x 960 x 1415	980	14	20	75
		DW24 tank option (230L)	2160 x 966 x 1582	1160	32.5	46	74
		DW48 tank option (420L)	2160 x 966 x 1631	1165	60	84	74
J44K	44	Standard day tank (100L)	2080 x 960 x 1415	1040	10	13	74
		DW24 tank option (230L)	2160 x 966 x 1582	1227	23	30.5	74
		DW48 tank option (420L)	2160 x 966 x 1631	1215	42.5	56	74
J66K	66	Standard day tank (180L)	2300 x 1060 x 1680	1432	11	15	73
		DW24 tank option (390L)	2344 x 1060 x 1900	1679	24	32.5	72
		DW48 tank option (700L)	2344 x 1060 x 1989	1709	43.5	58	72
J77K	77	Standard day tank (180L)	2300 x 1060 x 1680	1548	11	15	74
		DW24 tank option (390L)	2344 x 1060 x 1900	1735	24	32.5	73
		DW48 tank option (700L)	2344 x 1060 x 1989	1765	43.5	58	73
J88K	88	Standard day tank (180L)	2300 x 1060 x 1680	1508	9	12.5	76
		DW24 tank option (390L)	2344 x 1060 x 1900	1695	20	27.5	75
		DW48 tank option (700L)	2344 x 1060 x 1989	1725	35.5	50	75
J110K	110	Standard day tank (190L)	2554 x 1150 x 1680	1587	8	11.5	78
		DW24 tank option (505L)	2602 x 1150 x 1900	2006	21	30.5	77
		DW48 tank option (825L)	2602 x 1150 x 1948	2012	35	50	77
J130K	132	Standard day tank (340L)	3508 x 1200x 1830	2088	13	18	75
		DW24 tank option (868L)	3560 x 1200 x 2182	2488	33	46.5	74
		DW48 tank option (1630L)	3560 x 1200 x 2364	2656	62.5	88	74
J165K	165	Standard day tank (340L)	3508 x 1200x 1830	2168	10	13.5	75
		DW24 tank option (868L)	3560 x 1200 x 2182	2561	25.5	34.5	74
		DW48 tank option (1630L)	3560 x 1200 x 2364	2816	48.5	65	74
J200K	200	Standard day tank (340L)	3508 x 1200x 1830	2320	8	10.5	76
		DW24 tank option (868L)	3560 x 1200 x 2182	2713	21	27.5	76
		DW48 tank option (1630L)	3560 x 1200 x 2364	2978	39.5	52	76
J220C2	220	Standard day tank (340L)	3508 x 1200x 1830	2366	7.5	10	77
		DW24 tank option (868L)	3560 x 1200 x 2182	2736	19	25.5	77
		DW48 tank option (1630L)	3560 x 1200 x 2364	2994	36	47.5	77
J250K	250	Standard day tank (340L)	3508 x 1200x 1830	2400	7	9	82
		DW24 tank option (868L)	3560 x 1200 x 2182	2740	18	24	82
		DW48 tank option (1630L)	3560 x 1200 x 2364	2800	34.5	45	82

Based on manufacturer's information, may be subject to change.

Canopied units

D Series generating sets from 275 kVA to 830 kVA with weatherproof/acoustic enclosure

Three-phase (400/230V) Doosan engine	Standby rating kVA (0.8pf)	Base tank options	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load	Acoustic pressure level dB(A) @ 1m
D275	275	Standard day tank (390L)	4004 x 1380 x 2145	3160	6.5	8.9	83
		DW24 tank option (950L)	4056 x 1380 x 2340	3600	16	21.5	83
		DW48 tank option (2130L)	4056 x 1380 x 2618	3960	36.5	48.5	83
D300	300	Standard day tank (390L)	4004 x 1380 x 2145	3250	6.5	8.9	83
		DW24 tank option (950L)	4056 x 1380 x 2340	3690	16	21.5	83
		DW48 tank option (2130L)	4056 x 1380 x 2618	4050	36.5	48.5	83
D330	330	Standard day tank (470L)	4475 x 1410 x 2430	3540	7	10	81
		DW24 tank option (1368L)	4527 x 1410 x 2700	4060	21.5	29	81
D440	440	Standard day tank (500L)	5031 x 1560 x 2435	4090	5.5	7.5	85
		DW24 tank option (1770L)	5083 x 1560 x 2700	4750	19.5	27	85
D550	550	Standard day tank (500L)	5031 x 1560 x 2435	4262	4	6	84
		DW24 tank option (1770L)	5083 x 1560 x 2700	5044	15	21	84
D630	630	Standard day tank (610L)	5031 x 1690 x 2672	5381	4.5	6	88
		DW24 tank option (1950L)	5083 x 1690 x 2932	6099	15.5	20.5	88
D700	694	Standard day tank (610L)	5031 x 1690 x 2672	5381	4	5.5	88
		DW24 tank option (1950L)	5083 x 1690 x 2932	6099	14	18.5	88
D830	825	Standard day tank (610L)	5031 x 1690 x 2672	5670	3.5	5	88
		DW24 tank option (1950L)	5083 x 1690 x 2932	6370	12	16	88

Open units

T Series generating sets from 8.6 kVA to 17 kVA (single phase) or 11.5 to 22kVA (three phase)

Single-phase (230V) Mitsubishi engine	Standby rating kVA (0.8pf)	Base tank	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load
T9KM	8.6	Standard day tank (50L)	1405 x 715 x 1053	396	16	20
T12KM	12	Standard day tank (50L)	1405 x 715 x 1053	406	11	14.5
T17KM	17	Standard day tank (100L)	1700 x 896 x 1121	590	16	21
Three-phase (400/230V) Mitsubishi engine	Standby rating kVA (0.8pf)	Base tank	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load
T12K	11.5	Standard day tank (50L)	1405 x 715 x 1053	387	16	20
T16K	16	Standard day tank (50L)	1405 x 715 x 1053	406	11	14.5
T22K	22	Standard day tank (100L)	1700 x 896 x 1121	549	16	21

Based on manufacturer's information, may be subject to change.

Open units

J Series generating sets from 22 kVA to 250 kVA

Three-phase (400/230V) John Deere engine	Standby rating kVA (0.8pf)	Base tank	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load
J22	22	Standard day tank (100L)	1700 x 896 x 1221	750	14	20
J33	33	Standard day tank (100L)	1700 x 896 x 1221	750	14	20
J44K	44	Standard day tank (100L)	1700 x 896 x 1221	820	10	13
J66K	66	Standard day tank (180L)	1870 x 994 x 1360	995	11	15
J77K	77	Standard day tank (180L)	1870 x 994 x 1360	1128	11	15
J88K	88	Standard day tank (180L)	1870 x 994 x 1360	1088	9	12.5
J110K	110	Standard day tank (190L)	1950 x 1084 x 1330	1187	8	11.5
J130K	132	Standard day tank (340L)	2370 x 1114 x 1480	1498	13	18
J165K	165	Standard day tank (340L)	2370 x 1114 x 1480	1578	10	13.5
J200K	200	Standard day tank (340L)	2370 x 1114 x 1480	1716	8	10.5
J220C2	220	Standard day tank (340L)	2398 x 1114 x 1535	1766	7.5	10
J250K	250	Standard day tank (340L)	2398 x 1114 x 1535	1800	7	9

V Series generating sets from 275 kVA to 700 kVA

Three-phase (400/230V) Volvo engine	Standby rating kVA (0.8pf)	Base tank	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load
V275C2	275	Standard day tank (390L)	2900 x 1300 x 1590	2200	7	9
V350C2	350	Standard day tank (470L)	3160 x 1340 x 1805	3103	7	9.5
V400C2	390	Standard day tank (470L)	3160 x 1340 x 1805	2972	6.5	8.5
V440C2	440	Standard day tank (470L)	3160 x 1340 x 1805	3110	5.5	7
V500C2	500	Standard day tank (470L)	3160 x 1340 x 1805	3250	5	6.5
V550C2	550	Standard day tank (500L)	3470 x 1500 x 2043	3620	4.5	6.5
V650C2	650	Standard day tank (610L)	3470 x 1630 x 2095	3780	5	7
V700C2	700	Standard day tank (610L)	3470 x 1630 x 2050	4020	4.5	6

D Series generating sets from 275 kVA to 830 kVA

Three-phase (400/230V) Doosan engine	Standby rating kVA (0.8pf)	Base tank	Dimensions L x W x H (mm)	Dry weight (kg)	Run time hours @ 100% load	Run time hours @ 75% load
D275	275	Standard day tank (390L)	2900 x 1300 x 1670	2310	6.5	8.9
D300	300	Standard day tank (390L)	2900 x 1300 x 1670	2400	6.5	8.9
D330	330	Standard day tank (470L)	3160 x 1340 x 1592	2440	7	10
D440	440	Standard day tank (500L)	3470 x 1500 x 1829	2910	5.5	7.5
D550	550	Standard day tank (500L)	3470 x 1500 x 1815	3220	4	6
D630	630	Standard day tank (610L)	3470 x 1630 x 2162	3700	4.5	6
D700	694	Standard day tank (610L)	3470 x 1630 x 2162	3700	4	5.5
D830	825	Standard day tank (610L)	3470 x 1630 x 2185	4080	3.5	5

Based on manufacturer's information, may be subject to change.

PowerWAVE EL 100

Model	EL104	EL105	EL106	EL108	EL110	EL112
Power rating kVA/kW	4 / 2.8	5 / 3.5	6 / 4.2	8 / 5.6	10/7	12.5 / 8.75
Power factor	0.7					
Input						
Voltage / tolerance	230 VAC single phase, +/- 15%					
By-pass voltage	230 VAC single phase					
Input frequency	50Hz +/- 5%					
Max RFI	EN50091-2 Class A					
Output						
Voltage	230 VAC single phase					
Voltage stability	Static (balanced load) +/-1%, static (unbalanced load) +/-2%, dynamic (step load 0-100%) +/-5%					
Voltage recovery time	After step load 0-100% max. 20ms					
Frequency	50Hz					
Frequency tolerance	Line synchronised +/- 1% / free running +/- 0.2%					
Efficiency at 100% load	>87-91%					
Crestfactor	3:1					
Short circuit protection	Electronic short circuit					
Overload capacity	120% continuous, 150% load 10min. 180% 1min, 200% for 1 sec					
Total harmonic distortion (THD)	Linear Load <3% / non linear load (75% NP and CF 3:1) <5%					
Batteries						
Type	Sealed lead acid – maintenance free					
Number of 12V blocks	16	18			20	
Float Charging voltage	216Vdc	243Vdc			270Vdc	
End of discharge voltage	160Vdc	180Vdc			200Vdc	
Battery ambient temperature	20°C					
Battery protection	Circuit breaker					
Battery test	Automatic battery test once a week					
General						
Serial communication	Dry contacts plus RS232					
Software	T-Mon standard / SNMP module optional					
Protection degree	IP41					
Ambient operating temperature / altitude	0°C to 40°C / <1000m (above sea level)					
Standard	Emergency lighting EN 50171					
Ventilation	Forced air cooling					
Acoustic noise at 1m distance	<56 dbA					
Weight (kgs)	85	95	110	125	150	155
Dimensions (mm) WxDxH	500 x 300 x 1220					

PowerWAVE EL 100XA

Model	EL1005XA	EL1012XA	EL1030XA
Power rating VA / W	500 / 400	1250 / 1000	3000 / 2400
Power factor	0.8		
Input			
Voltage / Tolerance	230VAC single phase / 184V – 285V		
Frequency	50Hz +5%		
Max. RFI	EN50091-2 CLASSA		
Output			
Voltage	230VAC Single phase		
Voltage stability	Changeover mode +10% / battery mode +3%		
Voltage recovery time	After step load 0-100%. Max. 20ms.		
Frequency	50Hz		
Frequency tolerance	+1% in battery mode		
Efficiency at 100% load	>97%		
Crest Factor	3:1		
Short circuit protection	Electronic short circuit		
Overload capacity	120% continuous, 150% alarm load		
Batteries			
Type	Sealed lead acid – maintenance free		
Number of 12V blocks (Internal)	4	4	4or 8
Float charging voltage	54VDC	54VDC	54VDC
End of discharge voltage	42VDC	42VDC	42VDC
Battery ambient temperature	20°C	20°C	20°C
Battery protection	Double Pole DC Circuit Breaker		
Battery test	Automatic battery test / smart battery management		
General			
Serial communication	Drycontacts plus RS232		
Software	Optional monitoring & shutdown / optional SNMP module		
Protection degree	IP21		
Ambient operating temperature / altitude	0°C to 40°C / <1000m above sea level		
Standard	Emergency lighting EN50171		
Ventilation	Forced air cooling		
Acoustic Noise at 1m distance	<56 dbA		
Dimensions (mm) WxDxH	750 x 250 x 850	750 x 250 x 1250	750 x 400 x 1250

PowerWAVE EL 200

Model	EL210	EL215	EL220
Power rating kVA/kW	10 / 8	15 / 12	20 / 16
Power factor	0.8		
General			
Serial communication	Dry contacts plus RS232		
Software	T-Mon standard / SNMP module optional		
Protection degree	IP41		
Ambient operating temperature / altitude	0°C to 40°C / <1000m (above sea level)		
Standard	Emergency lighting EN 50171		
Ventilation	Forced air cooling		
Relative humidity	90% max (non-condensing)		
Acoustic noise at 1m distance	<56 dbA		
Input			
Voltage / tolerance	230/400 VAC 3phase, 4wires, +ground, +/- 15%		
By-pass voltage	230 VAC single phase		
Input frequency	50Hz +/- 5%		
Max RFI	EN50091-2 Class A		
Output			
Voltage	230 VAC single phase		
Voltage stability	Static (balanced load) +/-1%, Static (unbalanced load) +/-2%, Dynamic (stop load 0-100%) +/-5%		
Voltage recovery time	After step load 0-100% max. 20ms		
Frequency	50Hz		
Frequency tolerance	Line synchronised +/- 1% / free running +/- 0.2%		
Efficiency at 100% load	>87-91%		
Crest factor	3:1		
Short circuit protection	Electronic short circuit		
Overload capacity	120% continuous, 150% load 10min. 180% 1min, 200% for 1 sec		
Total harmonic distortion (THD)	Linear load <3% / non linear load (75% NP and CF 3:1) <5%		
Batteries			
Type	Sealed lead acid – maintenance free		
Number of 12V blocks	30		
Float charging voltage	405		
End of discharge voltage	300VDC		
Battery ambient temperature	20°C		
Battery protection	Circuit breaker		
Battery test	Automatic battery test once a week		
Weight/Dimensions			
Weight (kgs)	200	210	240
Dimensions (mm) W x D x H	520 x 715 x 1170		

PowerWAVE EL 300

Model	EL310	EL315	EL320	EL325	EL330	EL340	EL360	EL380	EL3100	EL3120	EL3160	
Power rating kVA/kW	10 / 8	15 / 12	20 / 16	25 / 20	30 / 24	40 / 32	60 / 48	80 / 64	100 / 80	120 / 96	160 / 128	
Power factor	0.8											
General												
Serial communication	Dry contacts plus RS232											
Software	T-Mon standard / SNMP module optional											
Protection degree	IP41											
Ambient operating temperature / altitude	0°C to 40°C / <1000m (above sea level)											
Standard	Emergency lighting EN 50171											
Ventilation	Forced air cooling											
Relative humidity	90% max (non-condensing)											
Acoustic noise at 1m distance	<56 dbA					<60 dbA		<65 dbA				
Input												
Voltage / tolerance	230/400 VAC three phase, 4wires, +ground, +/- 15%											
By-pass voltage	230/400 VAC three phase											
Input frequency	50Hz +/- 5%											
Max RFI	EN50091-2 Class A											
Output												
Voltage	230/400 VAC three phase											
Voltage stability	Static (balanced load) +/-1%, Static (unbalanced load) +/-2%, Dynamic (stop load 0-100%) +/-5%											
Voltage recovery time	After step load 0-100% max. 20ms											
Frequency	50Hz											
Frequency tolerance	Line synchronised +/- 1% / free running +/- 0.2%											
Efficiency at 100% load	>87-91%											
Crest factor	3:1											
Short circuit protection	Electronic short circuit											
Overload capacity	120% continuous, 150% load 10min. 180% 1min, 200% for 1 sec											
Total harmonic distortion (THD)	Linear load <3% / non linear load (75% NP and CF 3:1) <5%											
Batteries												
Type	Sealed lead acid – maintenance free											
Number of 12V blocks	30											
Float charging voltage	405											
End of discharge voltage	300VDC											
Battery ambient temperature	20°C											
Battery protection	Circuit breaker											
Battery test	Automatic battery test once a week											
Weight/Dimensions												
Weight (kgs)	260	276	332	494	494	572	630	780	820	970	1160	
Dimensions (mm) W x D x H	520 x 715 x 1170			590 x 860 x 1425			730 x 840 x 1425	1120 x 840 x 1675		1215 x 910 x 1755		



**Uninterruptible Power
Supplies Ltd,**
Woodgate,
Bartley Wood Business Park,
Hook, Hampshire RG27 9XA

Tel: 01256 386700

Fax: 01256 386701

Email: sales@upspower.co.uk
