Electrical Review suppliersguide

UPS / Standby Power

SURGES, SAGS AND general power outages can have potentially devastating effects to an organisation. Should this occur, an uninterruptable power supply (UPS) is your life line, providing critical power (and time) while you focus on getting back online as quickly as possible.

With the average data centre outage reported as costing more than £5,000 per minute, downtime really is money. An effective UPS system is your first line of defence, but what happens if this were to fail? It isn't worth thinking about.

Simply having a UPS system in place should not be the end of your due diligence when it comes to keeping your data safe. If a system is unreliable, or inefficient, then you might as well not have it at all.

The importance of UPS maintenance cannot be underestimated, with poorly planned maintenance cited as one of the principal causes for downtime. This section highlights what should be included in an effective maintenance plan, the benefits, and what you should look for in a potential vendor.

Prevention over cure

A reliable UPS system is your first line of defence against the surges, sags and power outages that could have potentially devastating effects to your organisation – reliable being the operative word. The importance of UPS maintenance cannot be underestimated, and should the worst happen, can your business afford to have any chinks in its uninterruptable armour?

ESTIMATES SUGGEST THAT data centre downtime can cost more than £5,000 per minute – the equivalent of a painful £300,000 per hour or £7.2 million a day.

According to Centrica's October 2017 'UK Resilience Report', an enormous 81% of UK businesses had experienced at least one harmful power-related failure in the past year. Given the potential consequences, it is staggering that more than two thirds of these incidents could have been prevented in the first place, with poorly planned maintenance cited as one of the principal causes.

With the stakes so high, it's comforting to know that mitigating the risk of such seemingly avoidable downtime (before it occurs) is relatively simple with some preventative maintenance in the form of a solid UPS maintenance plan.

What should be included in an effective maintenance plan?

There are no guarantees that a data centre UPS will never experience a failure. But having a comprehensive maintenance plan in place will boost your system's resilience and reliability. Not only does this minimise the risk of a critical issue occurring, it maximises the overall efficiency and ongoing performance of your equipment, and also helps to increase its lifespan. And if the worst does ever happen, it can ensure you overcome downtime as quickly and as pain-free as possible.

Emergency response

A solid UPS maintenance plan should give you greater coverage than a standard product warranty provides, with priority access to support from trusted technical experts. Most importantly it should clearly spell-out response times in cases of emergency.

Most service organisations will provide an eight-hour onsite response guarantee, but may offer a four-hour or even two-hour onsite response. Since time is lost revenue when it comes to downtime, ensure that your service partner is dedicated to getting you back online as quickly as possible.

Before the emergency technician is even onsite, your service provider should have provided phone support to help diagnose what happened, and find out if there are immediate steps that can be taken to keep your facility online and safe.

Preventative maintenance

According to a study by the Ponemon Institute, the number of preventative maintenance inspections completed annually drastically reduces downtime as a result of power loss.

Most UPS manufacturers recommend that a UPS and battery system should have a minimum of two preventative maintenance inspections annually. But it is important to find out what is right for your data centre, as requirements vary from facility to facility. Consider your UPS environment, as well as the criticality of the load supported. As a bench mark, quarterly inspections seem to be relatively commonplace.

Maintenance agreements should also include regular firmware updates, so your system is always running the most up-to-date software. Some of the most comprehensive UPS maintenance plans will even feature a remote monitoring service where trained and qualified technicians off-site are

continually keeping tabs on your UPS and battery performance. This means potential problems can be identified and solved way before they become a business-critical issue, which could cause your data centre to go offline.

Spare and replacement parts

Another crucial point to cover in a data centre UPS maintenance agreement is the availability of spare and replacement parts.

Your uninterruptible power supply system is a complex and highly technical piece of electronic equipment. Certain components, such as capacitors and batteries, have a very specific shelf life and will undoubtedly need replaced from time to time.

> Most UPS manufacturers recommend that a UPS and battery system should have a minimum of two preventative maintenance inspections annually.

Most UPS service level agreements will include some form of parts and labour as part of the emergency response they offer. But beware, as this coverage may actually exclude components such as batteries and capacitors, so be sure to thoroughly check what is covered.

Professional advice and expertise

A good maintenance plan provider should keep you up to date on maintenance items, repairs and manufacturer changes as routine procedure.

As systems inevitably reach end of life, assistance should be provided in reviewing the replacement options that are best for your business. It is also worth trying to avoid tying your organisation to a specific UPS manufacturer, as this will help ensure your best interests remain a priority, matching you with equipment that best suits your needs, not whatever the manufacturer happens to be pushing.

The benefits of a solid maintenance plan

Although unforeseeable equipment failures, malicious attacks and service provider failures are sometimes unavoidable, mitigating the risks that come with a potential power issue are for the majority of organisations, absolutely preventable. There is no question the benefits of a maintenance plan make it an essential investment for any facility.

Minimised downtime

Downtime can never be 100% eliminated, but regular maintenance checks and generally keeping a close professional eye on your UPS system, will help you spot problems before they become major issues and save you any painful loss in revenue.

Improved energy efficiency

Much like a car, a poorly maintained system will not run as efficiently as a regularly serviced system running at optimum performance. A UPS that has been proactively well maintained also requires less power to run, saving on energy waste and reducing critical running costs.

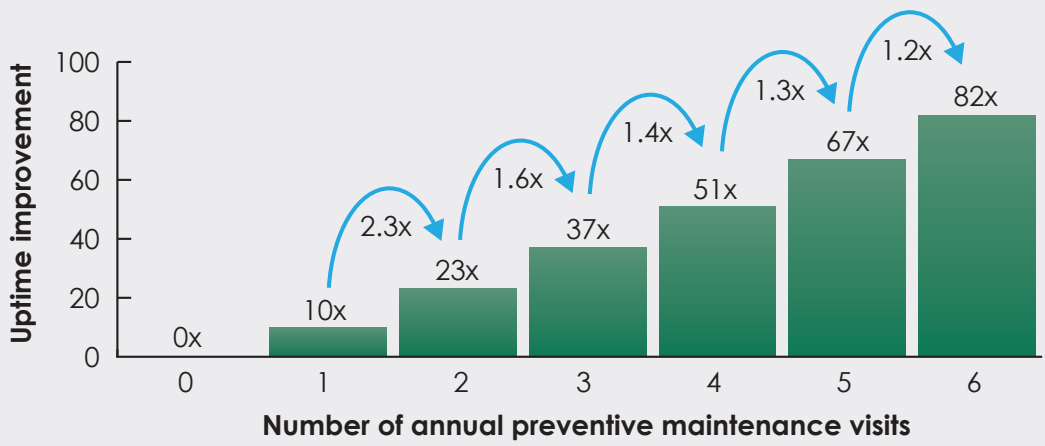
Better budgeting

As every data centre manager knows, planning for the future is key to the success of a facility. The last thing you want unexpectedly denting your budget is the need to replace your entire UPS. By deploying a proactive maintenance approach, you can avoid unanticipated failures and better plan for the future. Part replacements and overhauls can be predicted, which allows you to forecast costs and build them into budgets.

Conclusion

It is clear to see that a proper maintenance plan will ultimately end up paying for itself, and having the right preventative measures in place for your facility is almost (if not just) as important as the UPS system itself.

By employing a proactive, planned service approach, you can not only promote uptime, ensure peak performance and optimise energy efficiency, but also bolster the bottom line and enhance your tools for future planning.



Modular Multi Power UPS saves energy and money

Riello UPS's award-winning Multi Power product proves the economic and environmental benefits of modular uninterruptible power supplies.

WE LIVE IN an increasingly data-driven society. The 'Internet of Things' (IoT) and interconnected devices influence everything from our banking and shopping, through to manufacturing factories and even the way our healthcare is delivered. By 2025 it's predicted that the average person will interact with connected devices around 4,800 times a day – that's once every 18 seconds!

It's no surprise that according to the Global e-Sustainability Initiative (GeSI), data centres already consume over 3% of the world's total electricity and produce 2% of our planet's CO2 emissions. That's the same as the entire global aviation industry.

To keep pace with the ever-intensifying demands of the IoT, we'll need more and more storage and processing capacity. But it's not as simple as cranking up electricity generation to satisfy these increased requirements. The National Grid is creaking from decades of under-investment.

To meet these unprecedented future demands, we'll have to be smarter. We'll have to be more efficient. And we'll need to learn to do more with less.

Energy bills already account for up to 60% of a data centre's total running costs, so it's clear any efficiency savings are welcome, both environmentally and economically.

Significant steps have already been made to improve technologies in areas such as cooling and air conditioning. And now the move to modular UPS promises similar efficiency gains without compromising on critical power protection too.

Multi Power UPS – Scalable Performance & Efficiency At All Loads

Until recent years, uninterruptible power supplies tended to be large, static towers only capable of achieving optimal performance and efficiency when carrying high loads of 80-90%. To offer the required redundancy to mitigate against potential faults or failures, oversizing at initial installation was common, meaning that many UPS systems ran at low, inefficient loads, wasting huge amounts of energy in the process.

Chris Cutler, Corporate Account Manager for Riello UPS

More often than not, these units were also transformer-based and pumping out lots of heat, so they needed lots of energy-intensive air conditioning to keep them cool enough to operate safely.

But modular UPS like the Multi Power are revolutionising the way critical power protection is delivered. Rather than the old-style inefficient standalone towers, modular UPS systems are made up of several smaller rack-mount style units paralleled together to deliver the necessary capacity plus redundancy.

Our modular solution is available in a choice of 25 kW or 42 kW power modules, with cabinets that house up to seven modules each. With four cabinets able to run together in parallel, the Multi Power can deliver more than a megawatt of capacity.

The modular approach means capacity closely corresponds to a data centre's load requirements, eliminating the risk of costly and inefficient oversizing. Not only does this cut power consumption and energy waste, it also reduces the initial investment too.

Operating in online mode, the Multi Power offers efficiency of up to 96%. Even when carrying loads as low as 20%, eye-catching efficiency levels of up to 95% are achievable, reducing the amount of energy needed. Another major advantage of modular UPS is that it offers in-built scalability to 'pay as you grow' – when it's time for expansion, you can simply add in extra power modules as and when the need arises.

Compact yet power-packed modular UPS deliver higher power density in a smaller footprint – the Multi Power produces up to 466 kW per m^2 – freeing floorspace up for valuable additional server racks.

Modular units incorporate transformerless technology that generates less far less heat, so they don't need anywhere near as much energy-intensive air conditioning either. And in terms of UPS maintenance, because each separate power module and battery unit is 'hot swappable', they can be serviced or even replaced as and when required without the entire critical power protection system ever going offline.

One final benefit of modular UPS is that the units are also compatible with the various Energy Management Systems (EMS) or Data Centre Infrastructure Management (DCIM) software commonly used to automate operations throughout the industry. In reality, your modular unit acts as a 'smart' UPS collecting and exchanging data that's analysed in real-time to help optimise IT system performance and identify areas where efficiency improvements can be obtained.

Multi Power In Action: £315,000 A Year Energy Savings

Upgrading to the award-winning Riello UPS Multi Power delivered significant savings to one of the world's largest consumer goods suppliers. Their two major data centres were protected by UPS systems that had been installed around a decade ago. The large, static 400 kVA and 800 kVA units were running inefficiently on low loads ranging from 12-25%.

Overall UPS efficiency across both sites averaged just 92% – it was as low as 89% in the main switchroom – and just the air conditioning requirements for the system alone totalled 414 kW a year, an electricity bill of more than £315,000.

Replacing the older units with modern, modular Multi Power produced immediate results. Overall UPS efficiency rocketed from 92% to 96% across all load levels, drastically reducing energy waste. In total, the annual cost for running the uninterruptible power supplies and associated air conditioning at both sites was cut by a phenomenal £335,000. Cooling requirements alone were slashed by 72%, saving 297.3 kW energy a year.

All in all, the client saves roughly 1.25 million kWh electricity a year – enough to power 316 typical UK homes – while their carbon emissions have plummeted from 2,147kg to 603.5kg, a 71.89% reduction.

And these massive environmental and economic advantages achieved by moving to Multi Power have been delivered in less than half the previous space, as the overhaul resulted in a 59% per m^2 reduction in footprint.

Perfect proof that modular UPS enables much more to be done with less. Higher power density and improved energy efficiency, using less electricity and space.

Riello UPS's award-winning Multi Power modular UPS

Time For Your Move To Modular UPS?

Even though this previous example focuses on a hyper-scale data centre where any inefficiencies will obviously be magnified, similar savings are possible no matter the size of set-up of your facility.

For data centres in particular, the major boom in terms of growth took place around a decade ago. So many of the UPS systems installed during this time will soon be ripe for replacement. It's the perfect time to reap the rewards of moving to modular UPS like Multi Power – more power, less wasted energy, and a smaller footprint.

The initial cost of upgrading your power protection to modern modular UPS will be paid back handsomely through substantial improvements in energy efficiency, reliability, and performance. And not only do you get the tangible benefits of lower day-to-day running costs and improved energy management, you can also keep on top of your growing corporate social responsibility and regulatory requirements. Moving to modular Multi Power makes sense in so many ways.

With more than a decade's experience in the critical power protection industry and a proven track-record in the datacentre sector, Chris Cutler is Corporate Account Manager and data centre efficiency expert for Riello UPS.

Riello UPS is a leader in the design, manufacture, installation, and maintenance of award-winning UPS and standby power systems from 400VA to 6MVA that promote uptime and minimise system downtime in industries such as manufacturing, healthcare, transportation, education, and the emergency services.

For further information call 0800 269 394, email sales@riello-ups.co.uk or visit www.riello-ups.co.uk

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Optimised Performance and System Flexibility

FROM SERVER ROOMS that power SMEs, to server farms that host in the cloud, the data centres that support our corporations and public services are the backbone of the modern economy. Big Data and the IoT are driving data centre expansion and with data being created at an unsurpassed rate, big data is big business.

Data centre managers are challenged with constantly evolving demands on energy efficiency and availability and never before has it been so vital for those responsible for critical buildings and facilities to demonstrate flexibility when designing and updating their hard working electrical infrastructure.

As with many investments, however, a successful operation and attractive ROI ultimately depend upon the optimised performance and flexibility of the system architecture.

Rack-mounted modular UPS – for easy, fully-assured and time-saving integration

Socomec's Modulys RM GP is a 3-phase modular UPS system designed for 19" rack integration across multiple applications. Easy to integrate and install whilst simple to manage and maintain, it provides maximum availability and power protection in a compact design - leaving space for other rack-mounted devices.

MODULYS GP – modular UPS from 25 to 600 kW

The power output by a single MODULYS GP unit can be scaled up from 25 to 200 kW via the addition of power modules that are stacked vertically within a single cabinet frame.

The vertical modular system can be extended further horizontally up to three cabinets in parallel to reach a total output power of 600 kW. Designed with no single point of failure, the solution provides total redundancy of N+1 or N+2.

Masterys GP4: performance accessible to all

Every electrical infrastructure has its own specific set of requirements – which is why the Masterys GP4 range can be customized accordingly. The latest Masterys GP4 and BC+ have been designed to be easily configured – even during order processing – and they can also be adapted to the needs of existing installations.

Building from a catalogue base, with optional building bricks such as a Neutral Kit, IP21, Top Cabling, Top Ventilation, it is possible to create a fully personalized solution with a short lead time.

Energy Measurement for the specific demands of data centres

Diris Digiware is a fully digital, multi-circuit plug and play measurement concept, with a common display for multi-circuit systems. Compact and quick to install, it provides accurate and effective metering, measurement and monitoring of electrical energy quality. Infinitely scalable, it is capable of monitoring thousands of connection points.

Socomec's Diris Digiware system offers an accuracy of class 0.5 to IEC61557-12 from 2% to 120% of the current sensor primary rating.

Left: Socomec Masterys GP 4
Right: Socomec Monitoring and Metering Range

Socomec Transfer Switch Range

With three additional new technologies available unsurpassed levels of accuracy can now be achieved.

- PreciSense guarantees measurement accuracy across the global measurement chain regardless of the load profile. With complete confidence in the measurements, it is possible to determine relevant corrective actions.
- VirtualMonitor provides remote access for the real-time monitoring of protective devices, across the entire installation, without additional hardware or wiring.
- AutoCorrect will guarantee that the measurement system is working correctly, with automatic wiring control and error correction, also being available off-load.

Power hungry cooling systems

All Data Centre facilities have dynamic environments, making it difficult to manage thermal airflow. The challenge is to match the cooling delivered to a facility with the heat generated by the current IT load – all of which needs to be monitored.

Automatic transfer switches can enhance power availability and simplify the electrical architecture, ensuring standby and alternate power availability.

By ensuring that the switching system is fully certified to BS EN 60947-6-1, and choosing a manufacturer-built solution, these fully programmable switches can be integrated into the data centre management system using communication options including SNMP. When fitted with a maintenance bypass, they can be commissioned, tested and inspected with no down-time for the mechanical loads they typically serve.

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CENTIEL is a Swiss-based technology company designing, manufacturing and delivering industry-leading power protection solutions for critical facilities. The Company's range of class-leading, energy efficient, UPS systems offers the highest availability and reliability developed by the innovators of the industry's first transformerless UPS and the world's first three-phase modular UPS. CENTIEL's network of channel partners and subsidiaries is rapidly expanding, providing class-leading power protection solutions worldwide.

For further information please see: www.centiel.co.uk

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Critical Power Supplies is a leading independent UK multi-brand supplier of critical power and energy solutions including uninterruptible power supplies and standby power generators to 6MVA. As a multi-brand supplier we are well placed to provide you with the right power solution for your application and we work with a range of clients including M&E consultants, quantity surveyors, electrical contractors, distributors, resellers, corporates and end-users.

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Socomec provide solutions to a wide range of businesses concerned with Business Continuity, Power and Energy Performance, with sectors of expertise including Data Centres, Healthcare - Energy - Infrastructures - Industry and Buildings

Socomec is a specialist manufacturer of LV Innovative Power Solutions targeting 4 specific applications.

Power Conversion: Ensuring the availability of high-quality power and smart energy storage

- static uninterruptible power supplies (UPS) for high-quality power free of distortions and interruptions occurring on the primary power supply,
- changeover of static, high availability sources for transferring the supply to an operational back-up source,
- permanent monitoring of the electrical facilities to prevent failures and reduce operating losses,
- energy storage for ensuring the proper energy mix of buildings and for stabilisation of the power grid.

Power Switching: Managing power and protecting individuals and installations

- isolation and on load breaking for the most demanding applications,
- continuity of the power supply to electrical facilities via manual or automatic changeover switching systems,
- protection of persons and assets via fusebased and other specialist solutions.

Power Monitoring: Monitoring and managing energy performance

- measuring energy consumption, identifying sources of excess consumption and raising the awareness of occupants about their impact,
- limiting reactive energy and avoiding the associated tariff penalties,
- using the best available tariffs, checking utility bills and accurately distributing energy billing among consumer entities,
- monitoring and detecting insulation faults.

Expert Services: Enabling Available, Safe and Efficient Energy

Socomec's service team comprises qualified engineers whose mission is to guarantee the correct operation of your UPS systems. This comprehensive package includes commissioning, on site testing, 24 hour call out and rapid on site repairs, genuine original spare part, power quality and energy efficiency audits.

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> **Minimizing energy consumption** and operating expenditure to maximise your investment

> **Future proofing** your critical power facility

> **Managing the maximum capacity** of your electrical infrastructure

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Riello UPS Ltd, a leader in the manufacture of uninterruptible power supplies (UPS) and standby power systems from 400VA to 6MVA. The company is part of the Riello Elettronica group which has support offices in 80 countries.

Riello UPS products combine engineering excellence with high quality performance and energy efficiency, to enable reliable power for a sustainable world. The product range includes 22 solutions for powering the smallest desktop PCs to the latest supercomputers used in advanced data centre operations.

Reliability, innovation and customer service are paramount at Riello UPS. Customers value our cutting-edge technology with an unequalled range of service options.

The UK branch of Riello UPS is located in North Wales, operating from a large purpose built premises, comprising office and training facilities as well as a fully stocked warehouse. This enables an end-to-end service of comprehensive technical support and fast product dispatch.

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Power Control Ltd is a prominent and highly influential leader in its field with over 23 years of experience. Although UPS systems form the cornerstone of Power Control, its rich history and experience of the entire electrical path enables it to offer much more than just backup power.

Offering single and three phase, tower and modular UPS solutions, the technologies Power Control include in its UPS collection are of the highest calibre and provide complete peace of mind. The company also offers a wide range of ancillary equipment including batteries and diesel generators.

Supporting its wide product portfolio, Power Control provides bespoke solutions complete turnkey project management and is the preferred trade contractor for an array of businesses nationwide.

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