



POWER SOLUTIONS TO GIVE YOU THE EDGE

# THE UPS SOLUTIONS HANDBOOK



UPS SOLUTIONS  
1300 555 992  
[WWW.UPSSOLUTIONS.COM.AU](http://WWW.UPSSOLUTIONS.COM.AU)  
[SALES@UPSS.COM.AU](mailto:SALES@UPSS.COM.AU)  
[HTTPS://WWW.LINKEDIN.COM/COMPANY/UPS-SOLUTIONS/](https://WWW.LINKEDIN.COM/COMPANY/UPS-SOLUTIONS/)

# THE UPS SOLUTIONS HANDBOOK

This handbook is a complete guide to UPS Systems and critical power protection solutions. You'll find plenty of useful resources to help you understand the basics of UPS technology to assist you in choosing the best solutions for your power protection needs.

UPS Solutions offers a comprehensive range of services and products designed to serve the needs of a wide range of industries. Whether you're a small business, medium sized company or large enterprise, it is essential to know the basics of UPS Systems in order to ensure your business-critical applications are always on.

Data is growing and over the next decade the amount of information managed by data centres will grow by a factor of 50. The resulting aggregate electricity use for data centers continues to grow, leaving mission critical facilities in a state of vulnerability. In order to be in line with the current trends in data, there is an ever-increasing pressure to achieve near-perfect power availability and efficiency. Today's UPS technology offers many tools to help you stay up to date.

The cost of power outages can be significant for any business. To reduce the risk of data loss, downtime and increased costs, it is important to have UPS Systems, generators and power management software solutions that can deliver backup power during outages



# WHY UPS SOLUTIONS?

UPS Solutions is a fully owned Australian business that has been in business for over 17 years. To date, UPS Solutions has proudly sold and maintained over 50,000 UPS systems in the Australian market and we are proud of our on-going success.

As a government accredited provider of high quality power protection systems & services, we pride ourselves in being one of the longest lasting, full service UPS systems provider in the business.

With our deep knowledge and expertise in the industry coupled with our constant desire to better ourselves, we are here to serve today and into the future. Our client base extends from small businesses to multi-national corporations and government organisations.

Our company values are based on two simple words "Customer First". We regard customer service as the most important focus of our business. Providing partnerships in projects of any size or scale, ensures our customers' needs and requirements really do come first.

Here at UPS solutions, our speciality lies in four core areas: Field Services, Power Quality, Racks and Cooling. With an industry-leading knowledge of IT infrastructure support, we deliver on our promise to keep your systems running around the clock and damage free.

“**Knowing what your UPS system does should just be the beginning of your UPS knowledge.**”



# OUR VISION

Diligently working over the years, we have implemented and are constantly improving specialised techniques designed by our engineers and solutions experts to provide the right solution.

Our long term vision is to design and constantly improve the Australian economy with more efficient power quality.

UPS Solutions are now committed to being a rich source of information through educating our customers on the basics of UPS Systems.

**We offer a wide range of products to service your needs and provide customised solutions:**

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UPS Solutions provide the highest quality UPS systems and Power Products in the industry.

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Batteries for all brands of UPS systems and external battery banks or battery rooms.

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Specialising in Server and Comms Racks, we stock all standard sizes and for customised solutions.

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Data centre & IT room monitoring, which is crucial to maintaining a healthy and secure environment.

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# UNDERSTANDING ELECTRICITY

## Volts, Amps and Frequency

The main terms used when we speak about electricity are voltage, amperes and frequency.

Basically a volt (V) measures “pressure” in which electricity moves through either a circuit or wire and an ampere (A), or simply referred to as amp, measures “volume”. A nice analogy to help understand these two terms is water in a hose. The voltage is equivalent to the water pressure and amps is equivalent to the volume of water.

For an oscillating or varying current, frequency (Hz) is a measure of how many times a second the electrical signal oscillates.

## Single-Phase Electricity

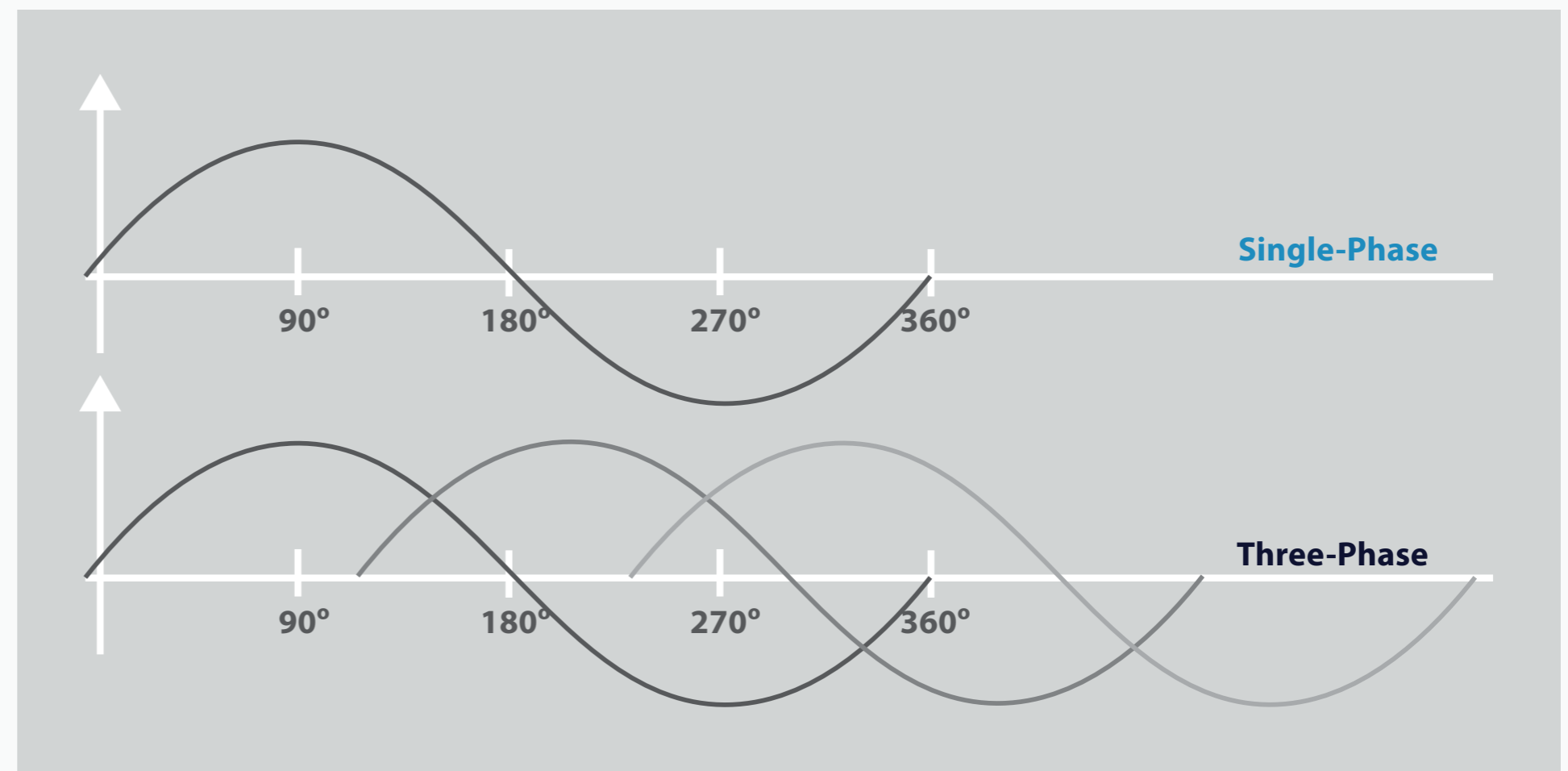
Single-phase electricity is what you have in your house. If you used an oscilloscope to look at the voltage coming from a single-phase outlet, you would see a single wave. Single-phase distribution is used when loads are mostly lighting and heating, with few small electric motors.

In a Single Phase there is one single sine wave, which peaks in voltage at  $90^\circ$ ,  $270^\circ$  and completes a cycle at  $360^\circ$ . Single Phase systems have fewer design costs, are less complex and have many application uses.

## Three-Phase Electricity

Three-phase power enables industrial equipment to operate more efficiently. With Three Phase Systems there are 3 distinct wave cycles that overlap. Each wave cycle is  $120^\circ$  out of phase with each other, providing a steady stream of power delivered at a constant rate. Three Phase systems have lower labor costs, greater conductor efficiency and higher power capabilities. Large scale industrial three phase UPS Systems are best for use in critical applications

Understanding your existing power infrastructure is a crucial step in determining the correct UPS Solution. Many existing computer rooms have single-phase loads at the rack level. However ground-up designs are increasingly moving three-phase power to the point of utilisation in order to gain efficiencies and reduce costs.



# WHY IS POWER PROTECTION SO IMPORTANT?

Leaving IT assets unprotected is a risk no company can afford, here are just a few reasons why protection from power issues is so important:

- Power outages can translate to substantial losses for the company affected, 33 percent of companies lose between \$26,000-\$595,000 AUD, 20 percent lose between \$595,000-\$2,600,000 AUD and 15 percent lose more than \$2,600,000 AUD.
- Utility power isn't clean. Electrical power can vary widely enough to cause significant problems for IT equipment.
- Utility power isn't 100 percent reliable, with the number of power outages up 19 percent in Australia last year.
- The problems and risks are intensifying as today's storage systems, servers and network devices use components that can falter and fail under power conditions.
- Generators aren't enough as they take time to startup and provide no protection from power spikes and other electrical disturbances.
- Surge Protection isn't enough as it can only protect from power spikes, not with other problems such as power loss, under-voltage and brownout conditions.
- Availability is everything these days. When IT systems are down, core business processes quickly come to a standstill.



CREDIBILITY



CLEAN POWER



CRITICAL APPLICATIONS



REVENUE

# POWER ISSUES

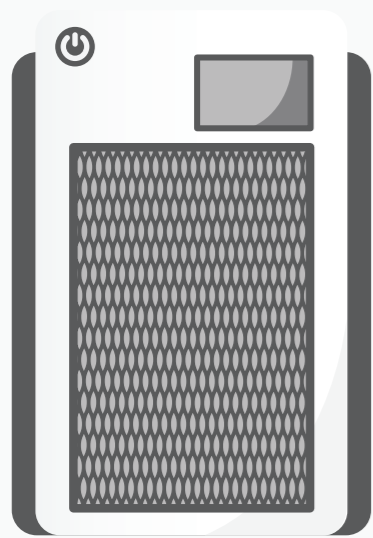
There are various power issues that a UPS will correct depending on topology and functionality incorporated by the manufacturer. Without a UPS, critical equipment can easily be damaged from all, or some, of the 10 main power issues that affect mains power, otherwise known as, dirty power. In many cases, power issues can be undetectable and cause gradual damage to circuits and other components which is a major cause of premature equipment failure. Many power quality problems are missed and go unresolved.

The high-tech IT equipment and control units of today are more sensitive to electrical disturbances. They are also more important to the critical functions of many businesses than they were in the past. This results in power quality problems that are more frequent and much more costly than ever before. A UPS System protects your business from common power issues including the one's that go unnoticed so risk of lost revenue and data loss is reduced.

## 10 Common Power Issues

<p><b>OUTAGE-BLACKOUTS</b></p> <p>Temporary power outage &gt; 10 ms</p>	<p><b>SAGS / BROWNOUTS</b></p> <p>Brief drop in voltage &gt; 16 ms</p>	<p><b>DYNAMIC UNDERVOLTAGE</b></p> <p>Alternating drop in voltage &gt; 16 ms</p>	<p><b>UNDERVOLTAGE</b></p> <p>Sustained drop in voltage Continuous</p>	<p><b>OVERVOLTAGE</b></p> <p>Sustained swell in voltage Continuous</p>
<p><b>LIGHTNING</b></p> <p>Brief but intense voltage spike Sporadic</p>	<p><b>TRANSIENTS (SURGE)</b></p> <p>Short overvoltage condition &gt; 4 ms</p>	<p><b>FREQUENCY VARIATIONS</b></p> <p>Any deviation from the fundamental frequency Sporadic</p>	<p><b>VOLTAGE DISTORTION Hf (Burst)</b></p> <p>Any deviation from the nominal sinewave form of the AC line voltage Periodically</p>	<p><b>VOLTAGE HARMONICS</b></p> <p>Current and voltage are distorted and deviate Continuous</p>

## WHAT DOES A UPS DO?



In general, a UPS protects your business from costly downtime by protecting your critical equipment from problems that plague electrical supply. Ensuring business-critical applications are always on.

### A UPS performs three basic functions:

1.

Protects against common power issues and work to regulate your power supply, compensating and supplementing as needed in order to give your appliances the smoothest and most consistent flow of electricity possible.

2.

Prevents data loss and facilitates graceful system shutdown. With so much data at stake these days, data protection is crucial. Data stored on devices that are subject to a hard system shutdown may be lost and critical system files might be corrupted without a UPS.

3.

Provide availability and power backup in the event of an outage. Utilising a UPS system will enable you to carry on working, save your data and take the steps you need to before you lose power.

## HOW DOES A UPS WORK?

A UPS continually regulates incoming voltage and provides battery backup in the event of a power failure. A UPS contains internal batteries that provide guaranteed continuous power while continually conditioning incoming power. Most UPS Systems commonly consists of a battery pack, a battery charger, an inverter system, a control system all contained within a casing. All the parts of the UPS System are critical to its correct operation and should be maintained for effective functioning.

## WHY DO I NEED A UPS?

The UPS provides power for enough time to last the glitch of short power outages. A UPS also protects in the event of longer outages by enabling the opportunity of a proper orderly shutdown of equipment. This means computers can continue running, there is no loss of data, no unexpected downtime and equipment is protected.

## I HAVE A GENERATOR, DO I STILL NEED A UPS?



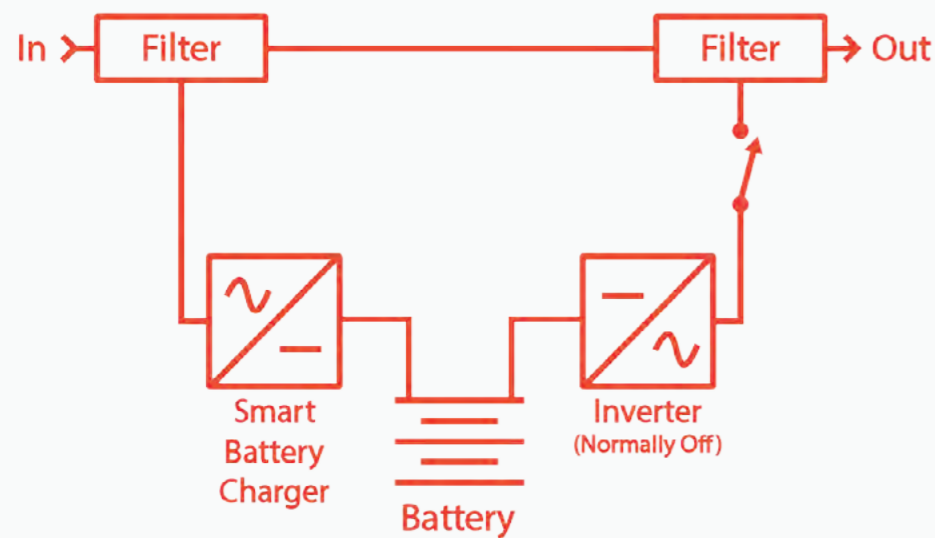
Similar to a UPS, a generator provides backup power. However, generators typically take 10-15 seconds to start up, depending on type. This is not an optimal situation for long-term backup servers and IT equipment, so during this time the UPS kicks in. UPS systems help reach synchronisation by bridging the gap between loss of power and when the generator comes online.

Maintenance, fuelling, compatibility, generator sizing, and physical integration into the target environment must be taken into account to ensure a generator/UPS pair that truly guarantees uninterrupted availability, even during extended power outages.

# MAIN TYPES OF UPS SYSTEMS

## Offline/Standby

Protects from 3 Power Issues



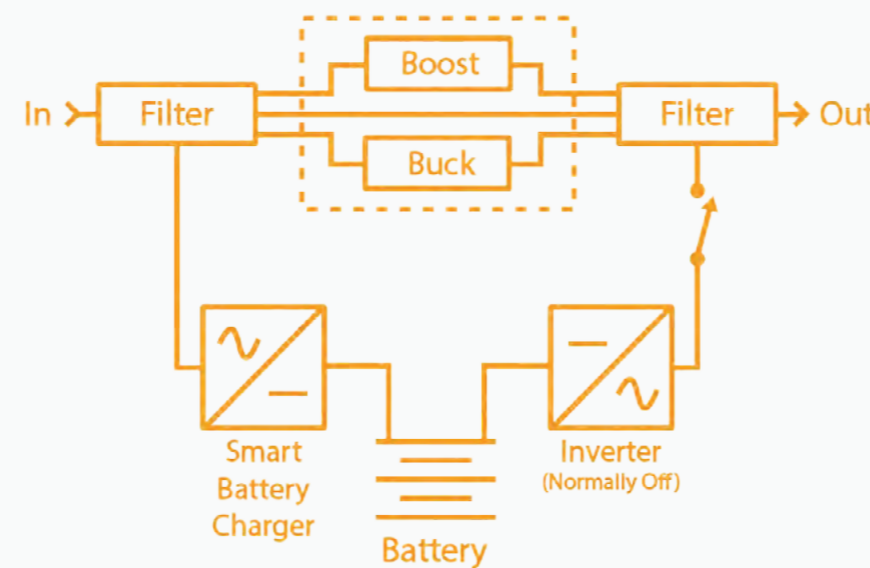
Standby or Offline UPS is the simplest and least expensive uninterruptible power supply system. The protected equipment is normally connected directly to incoming utility power. When the incoming voltage falls below or rises above a predetermined level the UPS turns on its internal DC-AC inverter circuitry, which is powered from an internal storage battery. The UPS then mechanically switches the connected equipment on to its DC-AC inverter output.

Low Power Rating



## Offline/Interactive

Protects from 5 Power Issues



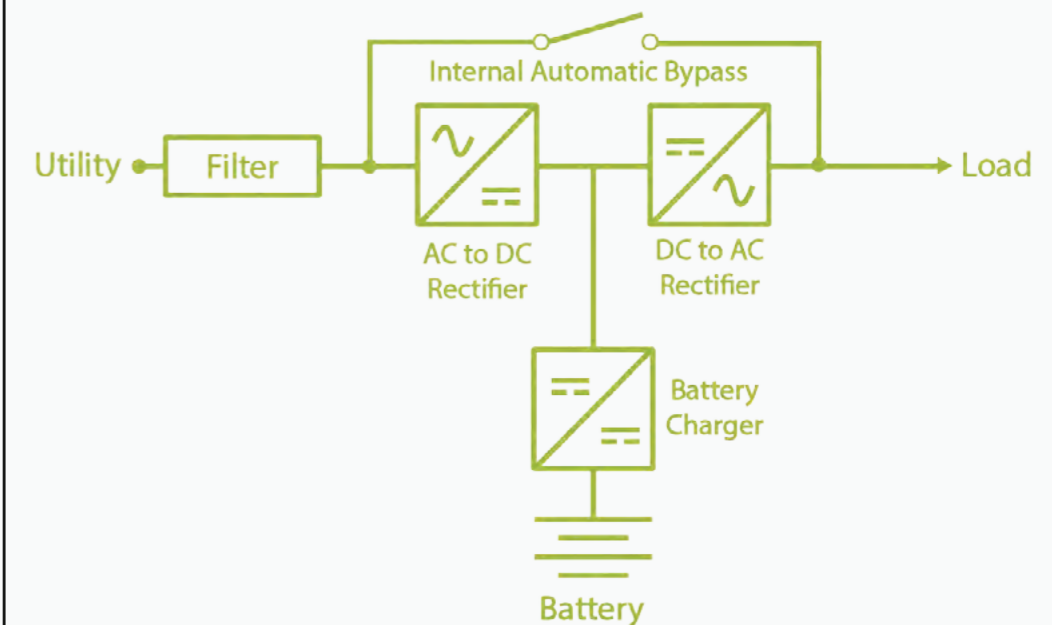
An Offline/Line Interactive UPS system operates in a very similar fashion to an offline UPS, except with the advantage of better filtering and output voltage boost/reduce features. An Offline/Line Interactive UPS monitors incoming voltage and detects when there is power loss or an anomaly. This UPS then uses transformers to either boost or lower the power by a set amount to return it to the acceptable range.

Mid Power Rating



## Online/Double Conversion

Protects from all 10 Power Issues



An Online Double Conversion is the most common type of UPS System. An Online UPS uses a more precise method by continuously converting incoming AC power to DC power and then converting the DC power to ideal AC output power. The Online Double Conversion UPS Systems provides your facility with the highest level of protection by isolating the equipment from raw utility power.

High Power Rating



# WHAT POWER ISSUES ARE COVERED?

A UPS System not only protects against common blackouts, but it provides protection from other unseen electrical problems that can occur. Of course this all depends on the type of UPS System; the better the UPS the more power issues it protects against. There are 10 common power issues and an Online Double Conversion UPS Systems covers all of them. The chart below illustrates what power issues each UPS Classification covers.

UPS SOLUTIONS	VOLTAGE PHENOMENON	TIME	E.G.	IEC 62040-3	UPS SOLUTION
1	OUTAGE - BLACKOUTS	> 10 ms		VFD Voltage + Frequency Dependant	Classification 3 OFFLINE
2	SAGS / BROWNOUTS	< 16 ms			
3	DYNAMIC UNDERVOLTAGE	< 16 ms			
4	UNDERVOLTAGE	Continuous		VI Voltage Independent	Classification 2 LINE / INTERACTIVE
5	OVERVOLTAGE	Continuous			
6	LIGHTNING	Sporadic		VFI Voltage + Frequency Independent	Classification 1 (TRUE) ONLINE REAL DOUBLE CONVERSION
7	TRANSIENTS (SURGE)	< 4 ms			
8	FREQUENCY VARIATIONS	Sporadic			
9	VOLTAGE DISTORTION Hf (Burst)	Periodically			
10	VOLTAGE HARMONICS	Continuous			

# UPS FORM FACTORS

UPS Systems come in a variety of different forms and sizes. The two most common are Tower and Rack Mount. However some UPS System models are a two-in-one rackmount/tower which can be mounted in a rack or installed as a tower model.

## Tower

Stand up-right to fit easily under a desk or network cabinet.



## Rack Mount

Can be mounted in a rack enclosure, typically used in server and networking applications.



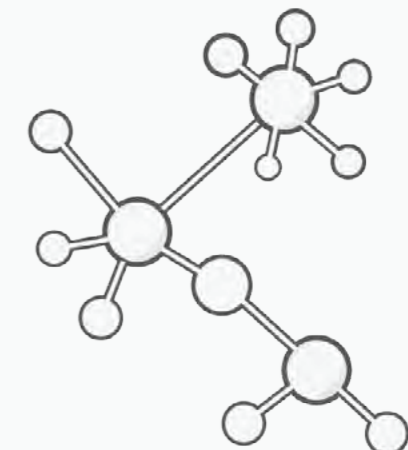
# CENTRALISED & DECENTRALISED

In a centralised configuration, a larger UPS supports multiple loads from a single point. Centralised UPSs are often hardwired into an electrical distribution board. A decentralised configuration allows multiple UPS's to protect a handful of devices. Decentralised UPS's generally utilise plugs and receptacles for the input and output connections.

## Centralised Configuration



## Decentralised Configuration





# WHAT UPS IS RIGHT FOR ME?

There are some key design considerations to take into account when deciding what the most appropriate UPS solution is for you. Since most environments support several different solutions, we can help to evaluate and choose the right UPS for you. Here are 10 tips to help you choose the right UPS Solution:

## 1. DEFINING THE CAPACITY OF A UPS SYSTEM

You need to ensure that the UPS supporting your server room is sufficient enough to support current and future business growth. Saving on a UPS installation during the server room design phase might turn into a greater replacement project later-on. For a future-proofed solution, making the right decisions at the beginning allows for enhancements and maintenance to be less complicated and more cost-effective for the lifetime of the product. Another important point is to make sure adequate working space is provided for access, replacement and all electrical equipment.

## 2. OFFLINE, LINE-INTERACTIVE OR ONLINE UPS?

UPS Solutions only recommend Line-Interactive and Online UPS Systems. The Line-Interactive UPS topology protects against five of the nine main power issues and is suitable for networking and server equipment. For total protection, we recommend an upgrade to the On-line UPS topology. The On-Line system is the most common UPS system used, it completely isolates mains power and consistently supplies clean power to vulnerable equipment.

## 3. ADDITIONAL UPS BATTERY PACKS?

A UPS typically has its own internal battery packs to support the Load (approx. runtime is 4-10 minutes). However, most new UPS systems offer the ability to add extra battery packs to increase the runtime. Please note, adding additional battery packs does not increase the capacity of the UPS in terms of providing more power, the extra battery packs will simply extend the battery runtime, typically each extended run battery pack will provide an extra 20-30 minutes runtime each. Statistically, in Australia the typical power outage is less than 5 minutes. The number of outages is normally from 10 to 30 per year. If your server room is not located in a particularly electrically unstable region, in a typical year, you can anticipate approx. 3 mains power failure that will last longer than 5 minutes.

## 4. SHOULD YOU INSTALL A BYPASS PANEL?

We would definitely say yes. For all critical equipment, even small loads, serious consideration should be given to implementing a bypass panel. The bypass panel allows you to switch over to mains power in the event of UPS system maintenance or failure. Unless there is a redundant UPS solution implemented, this is highly recommended to ensure the business can still function in the interim while awaiting repair or replacement.

## 5. IN ADDITION TO A UPS, WOULD WE NEED A SURGE PROTECTOR?

A UPS provides essential surge protection, however, additional surge protection is suggested to use in conjunction with all UPS units. A good quality surge device will prevent up to 15x significant surges, one of the leading causes of hardware failure. The surge protection device does not eliminate UPS issues altogether, but will prevent incoming power surges destroying expensive electrical infrastructure.

## 6. DO WE NEED SOFTWARE TO MANAGE OUR UPS?

A UPS will provide battery back-up even if no management software is installed, but in today's IT environments communication between the UPS and connected devices is essential. Some of the functions that UPS software provides:

- Automatic systems shutdown (graceful shutdown) if power outage exceeds a certain period of time
- Display power consumption data
- Restart equipment after mains power has been restored
- Send alerts based on certain triggered thresholds and alarms
- Provide battery status information

## 7. WHAT IS HARDWIRING?

Generally, smaller UPS systems connect directly to 10Amp or 15Amp power sockets (screw type captive plugs is recommended for all 10Amp and 15Amp UPS installations). UPS systems 5000VA and above, hardwiring of the UPS is necessary. Hardwiring involves running a dedicated electrical cable from the switch board to the Input of the UPS system via a bypass or isolation point. It's necessary to use a licenced electrician for all hardwiring work. The right cable size and circuit breaker must be used for proper operation and to ensure that the installation meets Australian electrical safety standards. The size of the cable and circuit breaker depends on the size of the UPS system.

## 8. UPS OUTLETS AND POWER DISTRIBUTION UNITS

Most of today's smaller UPS systems have a number of IEC Outlets at the rear of the UPS, typically 4 to 10 IEC Outlets. When additional outlets/outputs are required, a Power Distributions Unit (PDU) can be connected to the UPS to increase the number of outlets. For larger 3Phase UPS systems where the output is hardwired, PDU's are connected to captive GPO's in the flooring or ceiling to distribute power to the racks. The most common PDU's are basic, monitored and switched.

## 9. IS UPS MAINTENANCE NEEDED?

Ensure the reliability of your UPS system by putting the UPS under a preventative maintenance contract. Regular UPS maintenance will ensure proper use over time and prolong the life of your valuable investment. There is a long list of technical tests that are performed during a maintenance visit.

## 10. WHY UPS SOLUTIONS?

UPS Solutions are now one of the longest established, and nationally recognised, Power Solutions providers in Australia. Our long term vision is to design and constantly improve the Australian economy with more efficient power quality.

# WHAT UPS ACCESSORIES DO I NEED?

A complete power protection solution typically includes more than just a UPS. Below are some accessories worth considering:

- **UPS SNMP MANAGEMENT CARDS**
- **ENVIRONMENTAL MONITORING CARDS**
- **DRY CONTACT I/O CARDS**
- **19" RACK MOUNT RAIL KITS**
- **IEC POWER CABLES**
- **POWER RAILS AND PDU'S**
- **SURGE FILTERS**
- **EXTERNAL MAINTENANCE BYPASS PANELS**
- **BATTERY EXTENSION CABLES**
- **EXTENDED RUN BATTERY PACKS**
- **EXTERNAL BATTERY FRAMES**
- **FIRE RATED BATTERY CABINETS**



Contact UPS Solutions for more information on which accessories are best for your mission-critical applications.

# INSTALLATION

Smaller UPS units such as < 1500VA units can utilise a standard 10A GPO outlet. So they could be installed quite easily, plug and play. Although, we still recommend using our professionals as they will commission, and set up the UPS parameters to operate within strict electrical guidelines avoiding potential safety risks. For anything over 1500VA, you will require one of our UPS trained professional. Our team are well versed and have multi-trade disciplines, electrical, engineering, mechanical, IT and data. Ensuring your system is installed correctly but most importantly, safely. Our team can install anything from smaller 500VA systems up to 1MW systems for larger enterprise and data centre environments..

UPS Solutions can provide experienced technicians. Services include but not limited to:

- Pre-site survey
- Planning and Project Management
- Unpacking and Assembly Service
- Electrical installation and wiring



# SERVICES

## Planning & Electrical

UPS Solutions can provide electrical and installation services throughout Australia. Using skilled and experienced technicians and electricians is extremely important to ensuring the wiring and installation work meets Australian electrical standards and that the installation conforms to the manufacturer's specifications.

### UPS Solutions can provide a wide range of electrical and installation services:

- Electrical wiring and installations (Commercial/Data Rooms) – Power points, Data cabling, Data points
- Licenced electricians experienced in UPS installations and wiring
- UPS and Rack assembly, earthing, baying and mounting accessories
- Service Bypass Switch and ATS installations
- Power rail and PDU planning and installation
- Security and Environmental Monitoring installations

## Site Survey

Prior to delivering your mission critical infrastructure, UPS Solutions first conduct a site survey to assess the suitability of your solutions prior to delivery. Our experience with UPS installations gives our customers peace of mind that the products and services ordered are suitable for the intended application before products are delivered to site.

## Commissioning Services

This service provides an experienced UPS electrician to verify proper wiring of the system, energize the hardware and provide the customer with approximately one half hour of basic operator training on the system start up. During the start up, a comprehensive suite of diagnostic tests are performed on the installed hardware to ensure that it is functioning according to factory specifications in all modes of operation. Labour and travel expenses are included. This service does not include electrical installation of the system, or integration of software and/or accessories, nor does it include assembly or racks, cabinets or frames associated with the solution.

### Services also include:

- Performed inside or outside business hours
- Powering on UPS system
- Experienced Certified Field Service Engineer
- Labour and travel expenses included
- Installation verification
- Wiring Verification
- Written summary report
- Multiple levels of service

# MAINTENANCE

## Our Total Solution

Our dedicated team can deliver the solutions you need. We have a professional and comprehensive team of UPS engineers, qualified UPS electricians, network cables, air conditioning experts and solutions architects.

We understand the needs of our customers by working closely to provide customised solutions to grow with your business.



**REDUCING THE TOTAL COST OF OWNERSHIP**



**STRENGTHENING YOUR CORE BUSINESS INFRASTRUCTURE**



**ELIMINATE DOWNTIME AND MAXIMISE BUSINESS CONTINUITY**



**PEACE OF MIND**

## UPS Maintenance & Servicing

With our team of experienced UPS Engineers we proficiently service and maintain multi-vendor UPS Systems such as APC by Schneider Electric, Eaton Powerware, Emerson Liebert, Vertiv, MGE, Silicon, GE and Thycon. Our competitive maintenance contracts mean that you can reduce the total cost of ownership without sacrificing service with our core value being completely customer focused. UPS Solutions Maintenance Agreements are easy to establish and we can organise a priority service schedule if your systems are overdue.

## Generator Maintenance & Servicing

It is mission critical to ensure your generator is functioning correctly when you need it most, routine maintenance optimizes performance and safeguards against potential failures.

UPS Solutions provide service agreements for Atlos Copco generators, FG Wilson, Cummins, CAT, Rhino and all major brands of generators.

## Cooling Maintenance

Over 99% of the electricity used to power IT equipment is converted to heat, a single populated blade server on it's own can produce as much heat as 40 light bulbs (40x 100W = 4KW) ! If cooling fails, hazardous electrical fires may occur and gaseous fire suppression systems, if deployed, can cost upwards of \$5,000 to re-gas and test, or worse yet with no efficient fire suppression system in place our core business infrastructure could be destroyed.

# BENEFITS OF PREVENTATIVE MAINTENANCE

In order to keep your UPS systems running at maximum efficiency, it is imperative that Preventive Maintenance be performed on a regular basis. Our service policy is to prevent problems before they occur.

As the first line of defence for power problems, it's a risk to wait until problems arise with your UPS before taking the necessary actions. Preventative UPS Maintenance is essential in order to ensure business-critical applications are always on. UPS Solutions Preventive Maintenance services give your system the level of service it needs and you the peace of mind you deserve.

- Reduced Downtime
- Greater Energy Efficiency
- Improved Performance
- Prolong The Life Of The UPS
- Increased IT Productivity
- More Economical
- Less Complications

“ Two-thirds of downtime events are preventable, with insufficient maintenance being one of the main causes.

## RECOMMENDATIONS FOR A LONGER UPS LIFE

AGE?	WHAT?	WHY?	HOW?
< 3	Extended Warranty	Investment Protection	UPS Solutions Extended Warranty Program
3-7	Replace Battery	Ensure Performance	UPS Solutions Battery Replacement Program
+ 7	Replace UPS	Upgrade Environment	UPS Solutions Our Total Solution Program

# BATTERIES

The most vulnerable and most failure-prone part of your UPS are the batteries it houses. This is why regular maintenance of batteries is critical to ensure backup power is ready when needed and extend battery service life, preventing any costly downtime that may occur.

## Primary factors affecting battery life

### 1. Ambient Temperature

The rated capacity of a battery is based on an ambient and any variation from the ambient temperature of 25°C can affect performance and reduce battery life. Batteries that are too hot or too cold negatively affect the batteries ability to conduct and store energy. It is estimated that each 8-10°C increase in temperature reduces the battery life in half.

### 2. Cycling

During a power failure, a UPS operates on battery power. Once power is restored the battery is recharged for future use. This is called a discharge cycle. Every discharge and recharge reduces the capacity of a battery and once depletion of chemistry occurs, the cells fail and the battery must be replaced.

### 3. Battery Chemistry

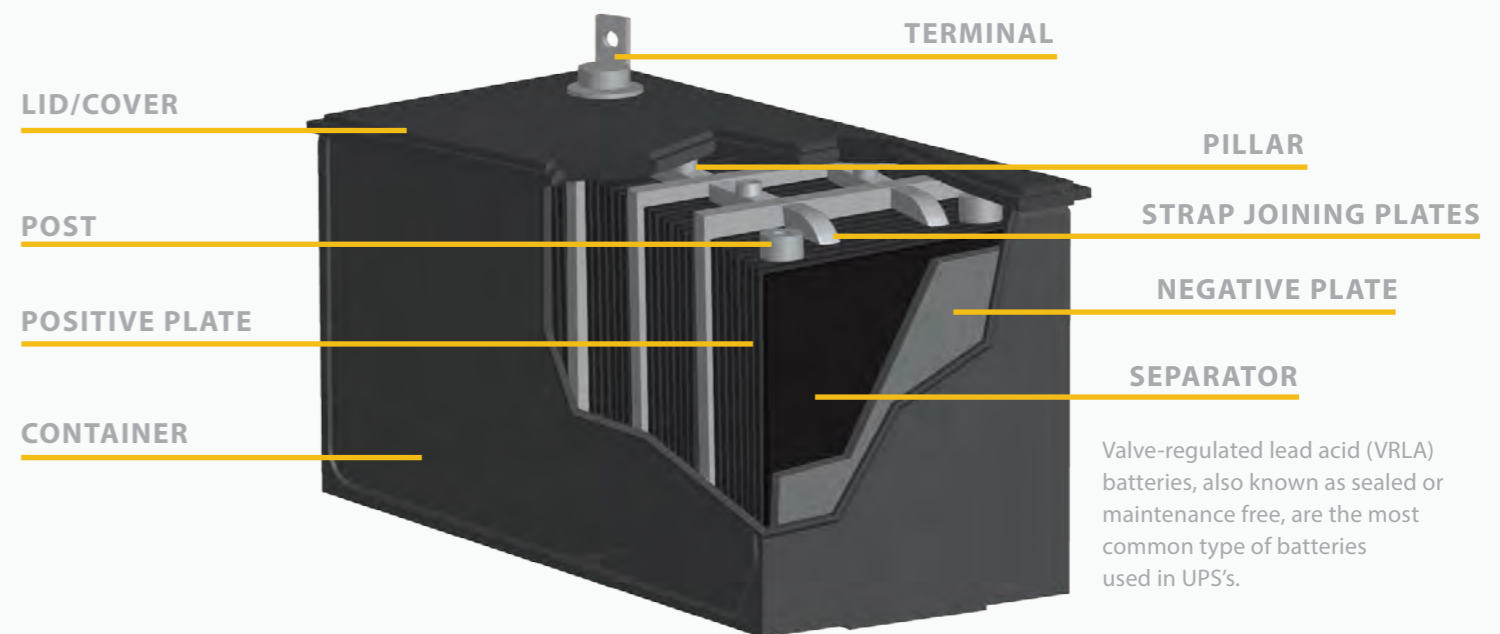
As a result of the chemical composition of UPS batteries, their ability to store and deliver power decreases over time. This decrease is inevitable regardless if all the guidelines are followed, batteries still require replacements after a certain amount of time.

### 4. Application

It's imperative that the right battery be used for the given application. Problems arise if the wrong battery is used. Make sure the correct battery in place for your needs to avoid unnecessary downtime.

### 5. Maintenance

The service and maintenance of batteries are critical to the reliability of the UPS. Regular maintenance extends battery life and also identifies ailing batteries before they fail.



# SOLUTIONS

## Turnkey Data Centres

With access to the latest research and developed systems, our solutions are scalable and adaptable to any IT room architecture and reduces time and complexity from concept and design through installation. Whether you are designing a new green field Server Room / Data Centre facility or just redesigning your existing server room, we have the products and expertise to ensure that the room is designed in the most efficient and resilient way possible.

Our design and deployment service process starts with our team of experts working closely with you, establishing the requirement, budget and future needs of your room. After the initial site inspection, or multiple inspections if necessary, our dedicated team of experts will provide a solution with the most suitable options based on your business requirements.

## InRow Precision Cooling

### WHAT IS AN INROW PRECISION COOLING SYSTEM?

Precision Cooling Systems sit in-between the racks and deliver a cool airflow to where you need it most. Rather than cooling the whole room in areas where cooling may not be needed, you can deliver chilled airflow only to the area that requires it.

### WHAT ARE THE BENEFITS OF IMPLEMENTING AN INROW DESIGN?

The average operational costs are significantly reduced compared to traditional methods of cooling and it is even easier to implement a redundant cooling solution. Precision cooling systems step up or down to meet the required cooling in the right place at the right time. Save money on energy cost, direct InRow cooling eliminates unnecessary usage after office hours or at other times when power consumption is reduced.

## Data centre Relocation & Migration

Peace of mind is our main goal when performing relocation services. Our practical methodology and replicable standards ensure a smooth transition for your business requirements.

### OUR METHOD:

- Decommissioning and terminate existing services
- Package and re-locate with specialised anti-shock transportation
- Reconnect services
- Start-Up and Commissioning
- Test and Tag

## CRAC Traditional Computer Room Air Conditioning

### WHY CHOOSE UPS SOLUTIONS?

Our experience with effective cooling distribution spans over a decade, we have been at the forefront of the server room cooling revolution successfully implementing and paving the way for many Australian Businesses.

### WHAT IS A CRAC UNIT?

A computer room air conditioning (CRAC) unit is a device that monitors and maintains the temperature, air distribution and humidity in a server room or data centre.

### WHY IS IT SO IMPORTANT TO COOL MY SERVER ROOM?

Mainframes and racks of servers can get as hot as a seven-foot tower of powered toaster ovens, so climate control is an important part of the data centre's infrastructure.

### HOW CAN WE IMPLEMENT A CRAC SOLUTION?

There are a variety of ways that the CRAC units can be situated. One CRAC setup has suction, forming cold aisles. The cold air flows through the racks where it picks up heat before exiting from the rear of the racks. The warm exit air forms hot aisles behind the racks, and the hot air returns to the CRAC intakes, which are positioned above the floor.

## Raised Floors

The science and engineering of the computer room raised floor was fully developed in the 1960s and the basic design has remained unchanged for over 50 years.

### COMPUTER ROOM RAISED FLOORING WAS ORIGINALLY DEVELOPED AND IMPLEMENTED AS A SYSTEM INTENDED TO PROVIDE THE FOLLOWING FUNCTIONS:

- Elevated anti-static flooring
- Structural engineered weight distribution
- Tracks, conduits & supports for cabling
- A copper ground grid for grounding of equipment
- A location to run chilled water or other utility piping
- Under floor cooling distribution system



# FAQ's

## 1. Why is my UPS beeping and giving an alert signal?

There can be multiple reasons your UPS is beeping. Some common ones are:

- The load is running off UPS battery power in response to a power outage.
- Your UPS battery requires a replacement.
- There is a critical fault in the UPS.

## 2. How often do I need to replace my UPS and UPS Batteries?

UPS Systems require replacement after they reach the end of their reasonable life expectancy of 6-7 years, some lower spec standby AVR models require replacement sooner. After this period the internal components such as the inverter, fans, capacitors, battery charger and intelligence module no longer provide a reliable source of protection, if they are not replaced we risk potential downtime and damage to our critical equipment. It is important to replace your batteries in (5) year design life batteries in 3-year intervals for correct UPS upkeep, (10) year design life batteries every 6-7 years. UPS Solutions will alert you in these intervals to let you know your battery is due for replacement if you have purchased the system or battery through us and/or have a service contract. A battery replacement schedule is crucial to avoid potential business downtime and damage to protected equipment. Towards the end of a batteries life expectancy, you can experience a significantly reduced run-time, overheating, battery swelling, acid leakage producing harmful fumes and loss of power and protection.

## 3. How do I achieve longer runtime?

Longer runtime can be achieved by installing additional battery packs or strings of batteries if the UPS has extended battery cabinet capabilities. To find out how many external batteries do you need to achieve your desired run time, please give our friendly team a call and they will be happy to help.

## 4. What size UPS do I need?

This depends on your load and the type of equipment that you have connected to the UPS. For example, if you have 3000W of load drawn by your equipment, it is advised choose a slightly larger UPS unit 5kVA or 6kVA. This way you will have coverage for incoming surges and/or heavy machinery drawing larger load when they first start up. If you don't know your current load give our friendly team a call to scope up the right size UPS for you.

## 5. Why do I need UPS?

The UPS provides protection of load against line frequency variations, elimination of power line noise and voltage transients, as well as voltage regulation and uninterruptible power for critical loads during failures of normal utility sources. A UPS is the single most-cost effective measure to assure system safety, security and uptime of mission critical data.

## 6. Do I need ongoing maintenance on my UPS?

UPS units are the front line to protect your critical equipment. They constantly battle with incoming surges and regulate the power output. Also, environmental factors, such as the dust and temperature can affect the life expectancy and the UPS protection for equipment. As such, over the years, internal parts tend to get damaged or lose performance. Therefore, it is important to have an ongoing maintenance plan for your UPS.

## 7. How should I look after my UPS to get the most out of it?

As well as servicing the system through a qualified service provider, it is best to keep your UPS system within recommended environmental parameters free from dust and debris, keep the system clear from obstructions and maintain a cool environment of 25 degrees.

## 8. What type of UPS is right for me?

UPS Solutions utilise IEC guidelines to provide high quality systems based on safety requirements, environment, equipment load and physical location. It is best to speak to a professional who is trained to take all factors into consideration. We provide complimentary scoping of the requirement to help our valued customers make the right decision.

## 9. What happens if my UPS fails?

The first point of action would be to speak to a professional who can dispatch a technician or qualified electrician, 1300 555 992 will be the best number to contact one of our experts who can help through the process. As a preventative measure it is crucial to install a bypass panel which allows you to switch over to mains power in the event of UPS system maintenance or system failure. Unless there is a redundant UPS solution implemented, this is highly recommended to ensure the business can still function in the interim while awaiting repair or replacement. Engaging in a service contract inclusive of parts, labour and on-site response service with UPS Solutions is the most effective measure to minimise risk and maintain business continuity.

## 10. Can I access my UPS remotely over a network?

The most common way to access this capability is by adding a SNMP Network Management Card. The device plugs into the UPS systems intelligence slot and includes complimentary shutdown software. Some of the UPS units that we provide come with the network management card pre-installed. UPS shutdown software is compatible across most operating systems including virtual environments such as VMware.

## 11. How do I install my UPS?

Smaller UPS units such as less than 1500VA units can utilise a standard 10A GPO outlet. So they could be installed quite easily, plug and play. Although, we still recommend using our professionals as they will commission, and set up the UPS parameters to operate within strict electrical guidelines avoiding potential safety risks. For anything over 1500VA, you will require one of our UPS trained professional. Our team are well versed and have multi-trade disciplines, electrical, engineering, mechanical, IT and data. Ensuring your system is installed correctly but most importantly, safely. Our team can install anything from smaller 500VA systems up to 1MW systems for larger enterprise and data centre environments.

## 12. How can a UPS help me?

A UPS contains internal batteries that provide guaranteed continuous power in the event of an outage. The UPS provides power for enough time to last the glitch of short power outages. But also protects in the event of longer outages by enabling the opportunity of a proper orderly shutdown of equipment. This means computers can continue running, there is no loss of data, no unexpected downtime and equipment is protected.

## 13. What are the main parts of a UPS?

A UPS System commonly consists of a battery pack, a battery charger, an inverter system, a control system all contained within a casing. All the parts of the UPS System are critical to its correct operation and should be maintained for effective functioning.

## 14. What do UPS Systems protect against?

A UPS System not only protects against common blackouts, but provides protection from other unseen electrical problems that can occur. Of course this all depends on the type of UPS System; the better the UPS the more power issues it protects against. There are 10 common power issues and Online Double Conversion UPS Systems cover all of them. These are: Outage – Blackouts, Sags/Brownouts, Dynamic Over Voltage, Under Voltage, Over Voltage, Lightning, Transient (Surge), Frequency Variations, Voltage Distortion and Voltage Harmonics.

## 15. Can I trade in my old UPS?

At UPS Solutions you can trade in your old UPS and get cash back. By trading in your old UPS you can upgrade to a new UPS to ensure the reliability of your hardware, extend the life of your entire system, help protect the environment and save money. Participating in Trade-UPS not only protects your business-critical infrastructure, but it also ensures that old products are disposed of safely and without harming the environment.

**16. In addition to a UPS, do I need a Surge Protector?**

A UPS provides essential surge protection, however, additional surge protection is suggested to use in conjunction with all UPS units. A good quality surge device will prevent up to 15x significant surges, one of the leading causes of hardware failure. The surge protection device does not eliminate UPS issues altogether, but will prevent incoming power surges destroying expensive electrical infrastructure.

**17. My business is small, do I really need a UPS?**

Power problems are not just restricted to larger organisations. PC's, servers and network are just as critical to your business as a data centre is to a larger enterprise. The cost of downtime is high with hardware, software, reputation and potential loss of goodwill. Recovery time for a business following an outage can also be significant and costly considering the inevitable delays that occur when rebooting locked-up equipment, restoring damaged files and re-running processes that were interrupted. A sound power protection strategy provides cost-effective insurance.

**18. Are power quality problems always noticeable?**

The simple answer is no. In many cases, disturbances can cause undetectable and gradual damage to circuits and other components which is a major cause of premature equipment failure. Many power quality problems are missed and go unresolved resulting in lost revenue and data. A UPS System protects your business from common power issues including the one's that go unnoticed.

**19. Why is power quality such a problem today?**

The high-tech IT equipment and control units of today are more sensitive to electrical disturbances. They are also more important to the critical functions of many businesses than they were in the past. This results in power quality problems that are more frequent and much more costly than ever before.

**20. I have a generator, do I still need a UPS?**

As generator will not protect equipment against power problems, you will often need a UPS in order to guarantee that equipment stays running until the generator kicks in, which can often take several minutes. In addition to this protection a UPS also improves the quality of the power produced by generators.

**21. How much UPS capacity should I use?**

We recommend that you install a UPS at approximately 75% capacity in order to allow for future expansion, unless additional future expansion has been factored into the solution via a modular or scalable UPS Solution. Additionally, batteries degrade over time, therefore by slightly over sizing you can still be covered for the initial runtime requirement after factoring in battery degradation during the batteries usable life.

**22. Why define the capacity of a UPS System?**

You need to ensure that the UPS supporting your server room is sufficient to support current and future business growth. Saving on a UPS installation during the server room design phase might turn into a greater replacement project later-on, for a future-proofed solution.

**23. What are the risks associated with a lack of battery maintenance?**

Improperly maintained batteries face risks of permanent battery load loss, fire, property damage and personal injury. Batteries that are regularly and pro actively maintained last the longest and provide the best performance.

**24. When I have one bad UPS battery, should I only replace the faulty battery or the entire battery string?**

One faulty battery doesn't mean you need to replace the entire string of batteries, this can be quite costly depending on the age of the batteries. You can replace the one bad battery with a new unit, however it is important that the health of the entire string is tested in order to identify any other faulty batteries that may have been strained or damaged. If the UPS batteries have exceeded it's usable life period, it is best to replace the batteries to maintain business continuity in the event of a power outage.

**25. My UPS has been in storage for over a year. Will the batteries still be okay?**

A battery's life will decrease by approximately 3% every 30 days they sit unused and without a charging regime. This is due to the self-discharge characteristics of lead-acid batteries. Therefore it is crucial that they are charged periodically according to the manufacturer's guidelines for charge duration, temperature and resting period. Charging even during storage is critical or permanent loss of capacity will occur over time.

**26. Are maintenance-free batteries actually maintenance free?**

The term 'Maintenance-Free' means that fluid is not required as sealed batteries are sometimes referred to as maintenance-free. However they still require scheduled maintenance and service. Preventative maintenance ensures the life of your UPS battery is maximised.

**27. What is the importance of power density when talking about batteries?**

Batteries differ markedly in the number of watts per cell. A higher density battery provides more runtime for the footprint. You may even find you can reach your runtime requirements with fewer battery cabinets, which reduces up front and lifetime costs of battery preventative maintenance.

**28. How do I properly dispose of a battery?**

It's imperative that your service technicians adhere to EPA guidelines for the disposal of all UPS batteries. Remember, it's the owner's responsibility to make sure these guidelines are followed.

**29. How can I communicate with my UPS?**

It depends on the UPS Systems capability however there are a myriad of ways you can communicate with your UPS, these include a standard USB, SNMP via a network card, RS232 via a serial port, RS485, Modbus, dry contacts (relay) and many other methods.

**30. Should I clean my UPS?**

Overtime your UPS may collect a build up of dust on the ventilation inlets and on the internal components. Generally It's not recommended you clean the internal components of a UPS system yourself. Cleaning the UPS is done as part of a regular preventative maintenance program.

**31. What does it mean if the UPS is showing a red light?**

A red LED is usually cause for alarm as it may be an indication that the batteries in the UPS need to be replaced or that the UPS has suffered from a critical failure. If the UPS is showing a red light, beeping or is not providing power to equipment contact UPS Solutions.

**32. What does it mean if the UPS is showing an orange light?**

An orange light generally means something is going on, but it's not critical. It could indicate that the system is on battery, is in bypass mode or a host of other functions. It could also mean that your UPS is beginning to fail.

**33. When should I replace my batteries and UPS?**

As a general rule of thumb we recommend replacing batteries after 3 years and UPS Systems after 6 years providing they are well maintained. In some cases its more cost effective to replace the entire UPS system than just the batteries alone.

**34. What is a hotswappable battery?**

Hotswappable batteries can be replaced whilst the UPS is running. No downtime required, however if there is an outage whilst battery work is being performed there will be outage vulnerabilities.

**35. What is a user-replaceable battery?**

User-replaceable batteries are usually found in smaller UPSs. Anyone can replace with simple tools and instructions can replace these.


# CONTACT UPS SOLUTIONS


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NSW VIC QLD  
ACT SA WA

## UPS SOLUTIONS

 1300 555 992

 [WWW.UPSSOLUTIONS.COM.AU](http://WWW.UPSSOLUTIONS.COM.AU)

 [SALES@UPSS.COM.AU](mailto:SALES@UPSS.COM.AU)

 [HTTPS://WWW.LINKEDIN.COM/COMPANY/UPS-SOLUTIONS/](https://www.linkedin.com/company/ups-solutions/)

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