

Finding the Right UPS for Your Needs

UPS = Uninterruptible Power Supply: a device placed between an AC power supply (e.g. a wall outlet) and a connected device (e.g. a computer) to prevent power related disturbances from the AC supply from adversely affecting the performance of the connected device.

Power protection is about more than just placing a UPS between the power source and the connected load. There are different types of UPS products on the market, offering protection against different ranges of power related disturbances. To choose the right UPS power protection solution it is important to consider the type of equipment needing protection, and matching this to a UPS which best fulfills that need.

Power related disturbances can wreak havoc in many different ways. Data corruption, system lockups, and premature hardware failure are just a few of the direct results of power problems. These consequences lead to none recoverable costs as businesses and industry are faced with hardware replacement, lost production time, and loss of revenue. These costs from power related disturbances can escalate into the millions of dollars per hour for larger business and industrial enterprises.

While on-site reviewing customer preparedness for power related disturbances we quite commonly find people that have a false sense of security. Often these audits are in response to problems that cropped up despite the presence of power protection measures. "...but we have a UPS in place," is something we've heard too often. When this happens it is usually because somebody has taken the step of deploying a power protection solution, but without identifying the underlying issues and requirements. The following would describe some of the more common issues encountered on customer sites:

Power related disturbances translate into lost hardware and data, lost production time, and ultimately lost revenue.
Are you ready?

- UPS equipment has not been matched to the load it protects, and the customer is under protected: The customer will continue to experience issues in this scenario owing to power related disturbances.
- UPS solution has not been properly engineered to meet the customer needs. The right solution will be based on a UPS that incorporates the right balance of features and necessary options to achieve the "solution".
- Practices or procedures that undermine the efficacy of the solution, i.e. equipment with dual power supplies have one connection made to UPS power, and the other is connected directly into utility power. Since power supplies are often load sharing the connected load is thusly still exposed to all power related disturbances through the unprotected connection. Employee training in terms of what to do in the event of a power related disturbance is also important. Pushing the wrong button may take your whole datacenter down!

The unfortunate reality is that in any of these above scenarios, money has usually already been spent to deploy a power protection solution that is not performing to expectation.

While you can knock a golf ball out of the sand-trap with your putter it is not the best tool for the job. The environment dictates the tool that is best for the job on the golf course. This truth applies to the design and implementation of the right power protection solution as well. There are many different factors which must be considered in choosing the right UPS solution for your critical loads. Runtime itself is only one of many issues to consider, and is independent of the actual level of protection the UPS provides against power related disturbances. The following represent some of the more major considerations that should be taken into account before choosing the right power protection solution for your needs:

1. **What are your present load requirements? What do you expect your load requirements to be in the future?**

Simple planning can avoid deploying a solution that is of limited future use.

2. **What electrical is already in place to support your UPS?**

Installing a UPS can involve installation of everything from input breakers, conduit, wire, splitters and disconnect switches, to transformers and the means of distributing the protected power to your connected load. It is important that this be planned out based on present needs and future expandability of the system. Any installation work must be performed in accordance with established electrical codes so as not to constitute a risk to life and property.

3. **Scalability of the UPS**

Is the UPS able to expand as your future needs grow? Is this expansion in the UPS capacity obtained by a hardware add-on, or by adjusting existing internal UPS components?

4. **Is the load considered mission critical?**

Equipment deemed mission critical is a must to the continuity of your business operations, i.e. data processing, communications, customer access to e-commerce solutions, expensive testing and evaluation processes that are costly to restart, etc. There are different types of UPS's on the market, providing varying levels of power protection. An environment deemed critical by virtue of function should have a UPS solution in place that provides the highest level of protection for the connected load. Connected equipment that has a high replacement value is also a good candidate for UPS's that provide a "total power protection solution".

The function or replacement value of the connected load can also dictate that a redundant UPS configuration is best for your connected load. A redundant UPS basically runs in parallel with another UPS in a load sharing capacity. In the event of a failure in one of the UPS modules, the other UPS takes over protection of the connected load.

5. **How long do we need the connected equipment to continue operating in the event of a power related problem?**

Is auxiliary power available (generator) so that operational continuity can be insured in the event of a prolonged power outage? Are you interested in merely being able to conduct an orderly shut down of connected equipment after a certain brief period of time? Do you want to protect a process or function for an indefinite period of time?

UPS can be an expensive way to provide for long runtime requirements, where customer needs may be better served by a UPS with a smaller battery configuration running in conjunction with a generator. Typically a UPS and generator work together where auxiliary power requirements are needed. It is critical to match the UPS with generator with the right type and size of UPS.

It is important to remember that as you grow your load within your IT environment this will impact inversely upon your runtime, i.e. increase load leads to decreased runtime. What level of scalability do you require in your UPS battery configuration?

6. **Do you require features such as a static or maintenance bypass switch in your UPS configuration?**

It is important to realize the differences between these different types of bypass switches. A maintenance bypass will give you the ability to have your connected load up and running while your UPS is being serviced or even replaced.

7. **What level of power management is required?**

Power management refers to the monitoring and control of the UPS and the connected load. Proactive power management is possible through the implementation of the right software and hardware solutions that work with your UPS. Power management software can usually be configured to initiate shutdown of connected loads, but can also provides reporting functions. Analysis and trending tools available with some power management systems can allow you to identify possible areas of future problems within your power protection systems.

If an environment is staffed 24x7 perhaps staff can take care of the process of shutting down connected loads in the event of prolonged power outages. This is not always the case, however, and shutdown must be automated under these circumstances. Is remote power monitoring and management of any value in your power protection program? Under some circumstances power management is not an issue when a robust application can simply crash at the end of the UPS runtime and be brought back up when power returns.

Increasingly larger organizations are interested in managed solutions where off-site monitoring of the UPS is conducted by power professionals who can monitor, analyze, recognize problems before they occur, and even dispatch service technicians to deal with problems.

8. Environmental factors

What space do you have available to deploy your UPS? Some UPS's are much larger than others in terms of size and weight. Some UPS's require a larger installed footprint than others. UPS's also require access for service purposes. Models that only require front access for servicing would present an installation advantage over those that require side and front access where floor real estate is an issue. Are there floor loading restrictions?

9. Product support

This is one of the most overlooked aspects of UPS purchases. At the small single phase UPS end of the market most manufacturers handle warranty support the same way...send them the problem unit and if they can't fix it they send you a new one. As the UPS's get larger however this is no longer an option. The question then becomes one of who is coming to fix the UPS, and when are they going to get on site. Response time to service related issues affects your system downtime. In the event that your UPS is in bypass mode, how long can you continue to operate in this manner? Are there locally trained and factory authorized service technicians? Are replacement parts stocked locally? Are spare parts kits available to maintain on site? All these factors impact on the support of your power protection systems.

10. Third party vs. direct factory trained and authorized service technicians

Product support at a technical level can also be critical to deciding what constitutes the right UPS for your operations. A manufacturer run service network can under most circumstances maintain a higher level of QA for service related work.

11. Future service contract support

Does the architecture of the UPS allow the user to replace components such as battery and power modules, or is it best handled by factory trained and authorized service technicians?

Careful consideration must be given to all these areas in implementing the right power protection solution for your needs. A datacenter supporting global e-business operations for a large corporation will require power protection that supports the 24x7 system availability demands of that environment. Power protection needs for this type of environment can be differentiated from less critical areas where more robust equipment is operating.

The right solution is not achieved through chance, and is not achieved on the basis of a product brand name but through planning and knowledge. At Potencia Technologies it is our job to walk you through this process, and insure that you obtain the right solution for your power protection needs.