

The right size UPS system



Figure 1: Newave's modular UPS systems grow along with the company's needs.

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If power consumption is not calculated correctly, capital goods can become very expensive over their service life. When selecting a UPS system, therefore, not only the right size but also knowledge about the availability and load characteristics of the equipment to be connected play an important role. With Newave, a leading UPS manufacturer, technological innovation and quality is a hallmark! At the heart of Newave development activities lies the quest for ever more efficient and energy-saving UPS concepts.

A UPS is a UPS – isn't it? Ultimately the idea is to generate power so the differences cannot be that large. Well, they may not be large, but they are crucial. In addition to the initial investment, UPS systems entail high consequential costs over their entire running time. The systems run continuously, and the power electronics mean they gobble up anything from hundreds of kilowatts to megawatts, day in day out. That makes for massive power consumption, especially if the systems are not constructed efficiently.

Newave, the Swiss UPS trendsetter, has been setting global standards in the field of right-sized and efficient uninterruptible power with the industry's first transformerless three-phase UPS and three-phase modular UPS. Their highly efficient and accurately sized UPS systems save energy costs and support a sustainable business outcome.

Requirements analysis

Initial and consequential costs are given unlimited attention prior to an investment. This starts with selecting the right size of UPS for the connected load. The nominal load according to the type plate on the consumer unit to be used would be wasteful. Electrical consumer units rarely require their full nominal load and most never actually reach this load. A rule of thumb with computers is that you should plan for actual consumption of only around two thirds of the nominal load.

Optimum efficiency reduces operating costs

The issue of the basic power to select when sizing a UPS does not only affect investment costs. There is no such thing as a power-neutral UPS system. Nevertheless UPS systems without a transformer on the output side are more efficient than systems with a transformer on the output side. Efficiency of 95% and above is achievable. At these levels, every percentage point really does matter. Due to the power consumed by a UPS, an efficiency increase of just 1% for power of 100 kW reduces operating costs by EUR 17,500 over five years.

Incremental upgrades

If the UPS system is designed to be redundant, in principle the operator must set up two identical systems. Both are running

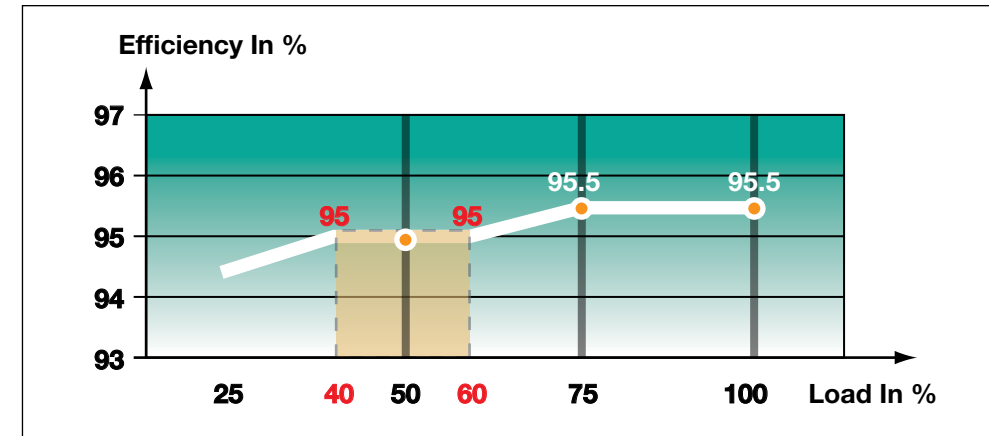


Chart 1: Newave's UPS systems have excellent efficiency in every working condition (even at partial loads) allowing energy savings and reducing the need for air conditioning.

even if only one is actually needed under normal conditions. The efficiency of the two UPS systems is at the lower limit since a maximum of 50% capacity utilisation can be achieved. However, the power consumption of the standby UPS impacts on the energy balance, drives up waste heat and as a result requires more cooling. More cooling for the UPS waste heat reduces the cooling volume for the blade servers and hence reduces the number of blade chassis that the computer centre can accommodate. A modular UPS system, such as the Conceptpower DPA from Newave, allows for incremental expansions whilst ensuring redundancy at all times. The total load is not covered by two identical systems; instead the modular UPS is fitted with power modules so that if one module should fail, the remaining modules can still carry the total load. Up to five power modules fit into the system racks in an n+1 configuration. Since the modules operate mutual load sharing, every module has a standby at all times, and the UPS runs with optimum capacity utilisation at very high levels of efficiency, which makes scaling easier. It is possible to start with just a few modules and add to them as required. Therefore there is no need to operate a UPS system designed for the full capacity of the computer centre right from the start.

Capacitive instead of inductive

Unlike conventional servers, blade servers have a leading power factor. Since these consumer units load the UPSs with capacitive power, the latter must be able to handle a leading power factor. The power factor therefore approaches a level of -0.95 to -0.90 capacitive. This has a negative impact on conventional UPS systems with output transformers which were developed



Figure 2: The Newave module makes replacement simple, minimising MTTR and the risk of failure. The time without redundancy is reduced to just a few minutes.

to deliver maximum real power for inductive loads with a lagging power factor. Consequently the UPS system reaches its power limit much more quickly than the planners expected during installation. This can be illustrated with an example: a conventional UPS system with apparent power of max. 300 kVA delivers only 214 kW nominal real power at a power factor of -0.95. If the power factor is -0.90, this falls to 182 kW. Both values apply compared to the nominal load if the power factor is +0.80 inductive. Newave's transformer-less UPS systems have the advantage here that they experience no loss of power at a power factor of up to -0.95 and only minimum power loss of approx. 3% at -0.90. A smaller Newave UPS can therefore be used even with blade servers.

MTBF or MTTR?

“Mean Time Between Failures“ (MTBF) is a common concept when talking about availability. This gives a theoretical value for the interval within which, statistically, a component could fail. At first glance, the modular UPS by Newave has a lower MTBF than a conventional model as, in principle, it comprises several UPSs, the individual parts of which have a negative impact on the calculations. But that is not how it works in practice! If a module in a modular Newave UPS system fails, it can be swapped out very quickly with no troubleshooting or downtime. The factor that is actually of relevance to users, the “Mean Time To Repair“ (MTTR) is therefore very low. Together with the savings in power consumption, these factors mean that the higher investment costs for a modular UPS system very quickly pay for themselves. ■

About Newave

Newave Energy is a leading manufacturer of uninterruptible power supply solutions that enable customers to protect their critical applications from operational losses and ensure business continuity. Innovation, quality, serviceability and environmental friendliness are key characteristics of our power protection solutions. Newave Energy has introduced modularity and transformer-less UPS-technology several years ago and these are the most important architectural trends in the UPS market today. Our mission is to help our customers from various industries to protect their critical applications efficiently and to lower environmental impact in a sustainable way. The company operates its own sales and service offices in eight countries and a worldwide network of business partners. The company was established in 1993 and is headquartered in Quartino (Switzerland).



Further Information
can be found on

www.newaveups.com