

Nominee: Schneider Electric

Nomination title: Galaxy VX UPS combines ultra-efficient EConversion energy saving system and innovative Lithium-Ion battery technology; meaning need no more trade-offs between efficiency and reliability

Schneider Electric's Galaxy VX family of UPS systems is intended for use in large data centres with power ratings between 0.7 and 4MW and meets all of the key concerns associated with power backup. Available in models rated at 0.75, 1.00, 1.25 and 1.5MW the Galaxy VX makes use of Schneider's novel 4-level inverter technology and EConversion power-saving mode to provide the optimum trade off between energy efficiency and power reliability. The Galaxy range is also modular and compatible with existing power architectures so that data-centre management can scale up according to need, rather than incur the capital expenditure of front-loading their UPS assets from the start in anticipation of growth that may not occur as speedily as they might like.

- What are your product's/solution's key distinguishing features and/or USP?

The main requirements of a UPS system in a large data centre are reliability, ease of maintenance, scalability, flexibility and long-term cost effectiveness in terms of both capital expenditure and operating costs.

The VX series is designed with durability and longevity in mind. Typically, issues that affect reliability revolve around fans, capacitors and batteries. All of the fans in the new systems are fully redundant and can easily be swapped out by users without needing to switch the unit into bypass mode.

In addition to this, the 4-level inverter technology drastically reduces the potential failures of power converters as it reduces the voltage stress on the main and other key components.

Menu-driven controls and improved firmware enable better management of batteries, leading to longer Mean Time To Replacement (MTTR). The firmware encourages procedures appropriate to the Lithium Ion batteries, with which the Galaxy VX series is equipped resulting in a battery life between 2 and 2.5 times longer than equivalent lead-acid batteries.

Maintenance of the new systems is also simplified thanks to the scalable approach which allows power modules to be swapped out easily. A novel I/O module which can be deployed in advance of the power modules allows cabling and other infrastructural components to be installed at an early stage, when the premises may be under construction or refurbishment, with the power modules added later when there is less danger of contamination.

The modularity of the Galaxy VX systems allows management to adopt a 'Pay as You Grow' approach, matching UPS system deployments to the data centre load thereby reducing

unnecessary capital expenditure. The Lithium Ion batteries allow the construction of smaller units which can be easier to install in space-constrained facilities.

Lower operating costs are also achieved thanks to the EConversion mode, a novel approach to Economy Mode which saves on energy costs and increases component longevity.

- What are the major differentiators between your product/solution and those of your primary competitors?

Many UPS systems have an “Economy Mode” in which some degree of electrical protection is sacrificed to save energy. Typical examples are the basic Economy Mode, in which a manual bypass switch overrides the double conversion path and connects the load directly to the mains input; or the double-conversion online variety, in which mains power is rectified to DC before charging the backup battery, following which it passes through an inverter to be converted back to AC.

In the former case the UPS essentially acts as a simple standby UPS, in which the battery and its DC-AC inverter are only deployed in the event of a serious disruption in the mains supply. This saves energy (typically between 2 and 3 percent) but reduces power protection as the IT load is exposed to raw utility mains power without the conditioning normally provided by an online UPS.

By contrast, double-conversion mode ensures that power output from the UPS always passes through the inverter, providing a regular conditioned supply to the load, and ensuring no loss of power in the event of a mains blackout because the load is always connected to the inverter and battery backup.

However operating in this mode means there is constant wear on the power components with attendant reduction in Mean Time Between Failure (MTBF) and a knock-on effect on reliability.

Schneider Electric’s unique EConversion Mode offers a better solution, providing energy savings while offering better power protection for connected loads than when operating in standard eco-mode. In EConversion mode the inverter runs in parallel with the bypass source, supplying the reactive part of the load and maintaining an input power factor close to unity. Thus the load is never exposed directly to the unconditioned utility power, as is the case with standard Eco Mode.

Keeping the inverter on in EConversion mode has a small impact on efficiency; it can drop below the 99% rating of ECO Mode depending on the connected load. Using this mode, the inverter is not

continuously regenerating output power to the load like in double conversion mode; instead the load is receiving unconditioned bypass power.

The main advantage of EConversion Mode is that the inverter can seamlessly take over to support the load in case of bypass utility failure. The inverter is also able to correct the power factor of the load and actively filter harmonic currents generated by the load. Operating in parallel with the bypass switch, the inverter is continually powered and ready to take over in the case of mains failure. The switch over is instantaneous and barely perceptible at the UPS voltage output.

- What tangible impact has your product/solution had on the market and your customers?

Typically, the regulated power supplied by a UPS operating in double conversion mode is rated as a Class 1 supply while that coming from a UPS in standard Eco mode is rated as Class 3. A UPS in EConversion mode also provides a Class 1 output, so there is no longer a trade off between efficiency and reliability. Combined with the cost savings afforded by modularity and smaller footprint, the Galaxy VX family offers the optimum mix of reliability, performance and cost effectiveness.

Why nominee should win

- Modular approach allows UPS assets to be deployed according to the size of the load, instead of excess capacity being deployed in advance, leading to reduced capital expenditure.
- Unique EConversion mode provides optimal trade off between the energy savings expected of simple economy mode and the benefits of permanently conditioned power being supplied to the IT load, resulting in reduced operating costs.
- Lithium Ion batteries result in smaller units, allowing for flexible deployment in space-constrained rooms.
- Modular construction simplifies maintenance operations
- Improved software prolongs life of Lithium Ion batteries.