

Is it time to consider medium voltage UPS systems in large scale data centers?



In many places around the world, data centers are becoming very large and are demanding more power. Server density is increasing rapidly, and power distribution systems are consuming more space. Some operators are allowing temperatures to rise inside the data center as a method of containing cooling costs, while others are using ambient air from outside to cool equipment. It could be viewed that such data centers are becoming like “industrial data factories.”

Smaller data centers are normally connected to the electrical distribution system along with other diverse city, industrial and commercial loads, all strung together with miles of overhead or underground cables. In these sorts of networks, longer term outages and significant voltage variations can be common place, making traditional double conversion data center UPS a sensible power protection choice.

By contrast, large scale data centers are often closely connected to the highly reliable electrical transmission systems that connect cities and power stations. Voltage regulation is very good and the more common problems are short voltage sags and micro-cuts, meaning the ultra-efficient, small footprint single conversion UPS technology as used industrially can be a viable solution.

The job of the UPS is to filter and transform incoming AC power so that it is “clean” and stable, as well as to supply emergency power from a string of batteries until a backup generator comes on line and reaches operating speed, a period of usually less

than 10 seconds—a timeframe mandated by fire protection standards in many countries. Short circuit fault levels in large data centers can also be high, making the design of circuit breaker protection difficult.

Industrial UPS devices are designed with higher overload ratings – not only making them more rugged and safer but also providing design engineers with more opportunities to implement protection discrimination. This means a fault is more likely to trip the circuit breaker protection without damaging the UPS. Traditional large industrial UPS have often been rotary, offering rugged performance but with the downside of having moving parts to maintain and providing less than optimal efficiency. However a new generation of large single conversion static industrial UPS are appearing on the market. One example is ABB's PCS100 UPS-I industrial-grade UPS, available in ratings up to 6 MVA and in voltages from 208 VAC through to 480 VAC in low voltage and now medium voltage.

Launched June this year, the PCS100 UPS-I was designed for mega-size data center with large, sensitive and critical loads. With a rugged centralized static transfer and a fully modular redundant inverter, the product is not only serviceable but also highly reliable and designed with a small footprint. The design life and temperature of components used in such products are also higher than typical commercial grade UPSs, which in combination with efficiency of more than 99% mean low total cost of ownership.

Industrial UPS systems are also compatible with the latest generation of energy storage technology such as small footprint super capacitors and lithium ion battery options along with the more traditional lead acid options. Lead acid batteries remain the lowest capital cost energy storage options but when footprint, lifetime costs and reliability are considered they may not always be the best option.

Considering its emerging needs and all the options for UPS, electrical products manufacturer Thomas & Betts, a member of the ABB family of companies, recently chose the PCS100 UPS-I industrial-quality UPS for its own data center in Memphis. As a demonstration project, the unit—produced by ABB—will back up the data center as well as other critical areas, including the customer service department.

“We see growth in the development of very large scale data centers in which medium voltage UPS can provide both design and total cost of ownership advantages,” said John Penny, General Manager GPL Power Conditioning. “Whether medium or low voltage is determined on a case-by-case basis and depends on site specifics and of course the owner’s preference. We believe it is a huge strength for ABB to be able to offer both options.”

Click here to watch how ABB provided a PCS100 UPS-I solution to Thomas & Betts. https://www.youtube.com/watch?v=J9_H1_7ULoc&list=UU7wvKWegeU9FGzEcVhJV0Dw

Click to find product information about the PCS100 UPS <http://www.abb.com/product/us/9AAC167832.aspx>

For more information, visit:
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