Perfect power

Protecting the South Pacific Games – 10
ABB provides power protection solutions to Papua New Guinea

Conceptpower DPA 120 UL and DPA 240 UL UPS – 12
The modular UPS for small and medium-sized data centers

In search of the perfect UPS – 16
Perfect power is the dream of every data center manager

Full power for industrial applications – 18
ABB’s rugged UPS PowerLine DPA
Do you want control of your businesses performance without compromising quality?

We have the solution for you here.
Welcome to the second issue of power for 2016. ABB’s power protection team continues to be successful with business led collaboration and joint research and development efforts across our UPS and power conditioning product groups.

I have recently been appointed the Local Product Group Manager for power protection NAM. My experience in power engineering and electronics spans over fifteen years. In 2009, I joined Thomas & Betts to lead the design, development and group management of power electronics and power systems hardware and software for T&B Power Solutions. During my tenure, I have experienced the evolution of our respective businesses and I am truly enthusiastic about the landscape ahead. Going forward we will continue to add value to our customers with a complete portfolio of power quality products that are the safest on the market, highly configurable for customer applications, proven to be reliable, efficient, and scalable. Our complimentary lineup of UPS, power conditioning and power distribution products position our product group to meet almost any power protection requirement across the globe.

Featured in this issue, are two new product introductions. The Quartino team extends ABB’s unique decentralized parallel architecture to support light industrial applications with the new PowerLine DPA modular UPS. In addition, the Quartino and US teams collaborate to develop the Conceptpower DPA 120 UL and DPA 240 UL modular UPS systems to support small to medium-sized data centers. With the development of these two new UPS product families, ABB power protection demonstrates its commitment to providing industry leading solutions that promise reliability, efficiency and scalability in both commercial and industrial environments.

Please be sure you read our feature article on how ABB provided power protection to the South Pacific Games in New Guinea. With successful completion of installing and commissioning two PCS100 AVCs and two PCS100 RPC systems that regulate a multi-sport Olympic complex, ABB’s power protection team in Napier, New Zealand, once again obtain international recognition for their innovative design and system performance capabilities. Also highlighted in this issue, learn about how ABB power protection showcased its latest UPS technology at key industry events in Kuwait and New Zealand.

Do data center managers long for the trifecta of perfect data center power? Read further in this issue to get an in depth perspective from Joergen Madsen, director of business development, ABB power protection. In this noteworthy article, Joergen discusses the three data center ideals – 100% availability, noise-free environment and no load losses – the search for “perfect power.”

Finally, I am happy to share that the alignment between ABB and Newave is now complete. On May 1 2016, ABB Power Protection SA becomes the future name of our technology group in Quartino, Switzerland. Newave and its ground-breaking technologies represent the foundation for our future growth in the UPS global marketspace. Thank you team Quartino for paving the way!

In closing, I look forward to a prosperous year for our group and thank you for your support and for reading this monthly update.

Enjoy this issue of power.

Hans Pfitzer
Local Product Group Manager, NAM
Power Solutions
Discrete Automation and Motion division
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Contact Us – power protection made easy!

Scan our QR Codes with your smart phone to find web links, videos or event pages, providing further details about ABB's products and services.
Increasing power protection in Kuwait

The Discrete Automation and Motion (DM) division in Kuwait hosted an event in February on power protection and UPS systems.

“The Kuwaiti market has good potential for growing our UPS business and the event was intended to position ABB’s power protection portfolio with various stakeholders, consultants, end users, EPCs, electrical contractors and data center system integrators,” said Mostafa State, DM team leader, Kuwait.

The event saw over 100 diverse attendees: end users, consultants and contractors. Ahmad Awad, regional sales manager, MEA, presented relevant case studies to the audience.

The main points of discussion were:
- ABB’s latest UPS technology
- Modular and transformerless technology
- Centralized parallel architecture vs. decentralized parallel architecture
- Double conversion product portfolio
- ABB three-phase modular product series
- ABB three-phase standalone product series

The event presented a great opportunity to penetrate the Kuwait market by showcasing the latest technology and trends in power protection systems. The feedback and the queries generated after the event showed the eagerness of the market to change and proved the need for the latest technology in new projects.

“ABB’s Power Conversion team in the Gulf is taking this step as one of several measures to reinforce product positioning in Kuwait and create a good installed base in the region. This is one of our initiatives to penetrate new markets, where our product offering and awareness is weak,” added Naji Karam, sales manager, Power Converters.

To find out more about ABB’s power protection solutions:
Web: www.abb.com/ups
Showcasing ABB's technology in New Zealand

A wide range of power and industrial customers took in a variety of technology topics at ABB's technology event held at the AirForce Museum in Christchurch and the ASB Showgrounds in Auckland.

The half day programme (which ran in separate morning and afternoon schedules) featured leading local and international experts on a wide range of product, service and new technology topics.

The 15 topics covered in the programme included integrating renewables, robotics and innovative power protection solutions. In addition to the presentations, attendees interacted with ABB employees alongside new technologies including Yumi, the collaborative, dual arm, small parts assembly robot solution, shown for the first time in New Zealand.

Ewan Morris, ABB in New Zealand’s Managing Director, said the programme was designed to appeal to a wide range of customers across utility, industrial and transport and infrastructure sectors.

“As ABB’s portfolio is broad, this event was a good way to demonstrate technology topics to a wider group of customers. Initial feedback from both customers and employees alike has been very positive, and we want to ensure that we keep communicating the latest technologies and innovations created here locally, and globally within ABB.”
New name for Newave
Newave becomes fully integrated within ABB

When uninterruptible power supplies (UPSs) are discussed, the company name “Newave” is often mentioned. After all, Newave has been a pioneer in the world of UPS for over 20 years. Newave introduced the world’s first single-phase transformerless stand-alone UPS, the PrimeWave, the first modular UPS ideal for upscaling and providing a low cost of ownership and the unique decentralized parallel architecture (DPA) - featured in UPSs like the Conceptpower DPA 500.

Founded in Ticino, Switzerland in 1993 to market innovative UPS technology, Newave SA has had an illustrious history and its unprecedented success in the field of UPS attracted the attention of the ABB Group. ABB has a complementary portfolio that includes power conditioning and power switching products designed to solve power quality issues in a variety of commercial and industrial applications. Based on the synergy between the two companies in the power protection business, ABB acquired Newave in early 2012.

As with any acquisition, integration was not an overnight event. Many business aspects needed to be aligned and this all took time.

However, the alignment is now complete and as the final act of integration, Newave SA will, as from 1 May 2016, become known as ABB Power Protection SA.

As far as customers are concerned, all the company representatives stay the same and there will be no change in any physical locations. It will be business as usual.

What will change is the breadth and scope of the solutions that can be offered: ABB Power Protection SA has access to a global team of local business units and channel partners - and an array of innovative power protection products so is well positioned for further growth in the global UPS and power protection market.
## It’s business as usual with PCS100 power protection

### Five reasons to invest in power protection

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eliminate unwanted downtime</strong></td>
<td>Power protection is important for 24/7 processes in industrial manufacturing plants. A slight disruption in power caused by external environmental factors can result in the whole, or parts of a production line to stop. This can lead to production targets not being met. ABB’s power protection portfolio can eliminate unwanted downtime by protecting sensitive industrial and commercial loads from voltage disturbances.</td>
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<tr>
<td><strong>Maintain quality production output</strong></td>
<td>When production lines are restarted or operate at less than optimal voltage, the product quality of the items being manufactured can suffer. This can result in loss of quality and can damage a supplier’s reputation, which will eventually cause a loss in profitability for the manufacturer. When a sag, surge or outage occurs, ABB’s power protection products provide continuous voltage regulation.</td>
<td></td>
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<tr>
<td><strong>Minimize waste of resources and materials</strong></td>
<td>Usually when a production line stops, raw and partially completed materials can be damaged due the production cycle not being completed. This creates waste, as many materials cannot be reused for commercial sale. ABB offers complete power protection and provides enhanced energy efficiency by reducing system losses, thereby improving power quality and providing equipment immunity from power quality events on the AC network supply.</td>
<td></td>
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</tr>
<tr>
<td><strong>Prevent damage to customers machinery</strong></td>
<td>Uncontrolled stoppage on a production line can also damage the production line tools. This increases maintenance costs and time required for repair purpose, which has an impact on the quantity or amount of product being manufactured. Voltage sags and surges and imbalance also stress the power supplies in the production tools, leading to premature failure of electronic components, which adds to the maintenance costs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Increased profits</strong></td>
<td>The highly reliable PCS100 products are designed for harsh electrical environments whilst also providing high efficiency (greater than 98 percent). This will ensure your equipment is protected at all times. Small confinements are made easy thanks to the unique modular design of the PCS100 portfolio, saving storage space. Lowest total cost of ownership means very low maintenance, providing continuous output, allowing power quality to be improved and profits increased.</td>
<td></td>
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</table>
Protecting the South Pacific Games

ABB provides power protection solutions to the South Pacific Games in Papua New Guinea.
ABB was proud to deliver its sophisticated power conditioning technology to support the 2015 South Pacific Games in Port Moresby, Papua New Guinea; an international multi-sport event, recognized and endorsed by the International Olympic Committee (IOC). A total of 24 countries from around the South Pacific took part in the event, which was held from 4 – 18 July 2015.

Unreliable grid supply due to voltage sags and surges are typical in a country such as Papua New Guinea and these would have resulted in unacceptable consequences for the stadium and the South Pacific Games, such as flickering lights, air-conditioning trips and malfunctioning time keeping and recording equipment.

ABB installed and commissioned two PCS100 AVC’s and two PCS100 RPC systems to regulate utility supply to the stadium (AVC), while minimizing reactive loading of the utility by way of power factor correction (RPC). Two units of the PCS100 AVC active voltage conditioner, 600 kVA each, were installed in the Taurama Aquatic Center & Indoor Sport Complex, one of the main venues where swimming, basketball, volleyball, and a variety of other indoor sports took place. This installation was part of an overall refurbishment of the stadium, in time for the games. The AVC and RPC products helped optimize grid loading, while ensuring a reliable supply for lighting, air conditioning and other services vital to the success of the South Pacific Games.

The PCS100 AVC is an inverter based system that protects sensitive industrial and commercial loads from voltage disturbances. Providing fast, accurate voltage sag and surge correction as well as continuous voltage regulation and load voltage compensation, the PCS100 AVC has been optimally designed to provide equipment immunity from power quality events on the supply network.

The PCS100 AVC requires no batteries, as it draws the additional energy required to make up the correction voltage from the utility supply. With no ongoing maintenance costs typically associated with batteries, the cost of ownership for a PCS100 AVC system is very low.

Based on a unique modular design providing high reliability, the PCS100 RPC will provide such benefits as;
- Preventing costly penalties due to poor power factor or harmonics.
- Ensuring correct operation of 3-phase rectifier loads, extending their lifetime, by correcting for voltage unbalance.
- Lowering maintenance costs by not exposing equipment to poor quality power.
- Eliminating the risk associated with traditional power factor capacitor correction systems such as, overheating caused by harmonic resonance problems.

With the successful completion of this project, ABB’s power conditioning solutions are once again obtaining international recognition for their innovative design and unrivalled performance to protect highly sensitive equipment.
Conceptpower DPA 120 UL and DPA 240 UL UPS

The modular UPS for small and medium-sized data centers.
Today’s data centers require continuous uptime. That target is why ABB’s Conceptpower DPA 120 UL and DPA 240 UL UPSs are based on Decentralized Parallel Architecture (DPA). Only a truly redundant architecture like DPA allows online modules to be swapped out while the system is running. Each high-reliability, standardized module is self-contained and can be swapped at any time, so nothing has to be ever switched off – making routine maintenance safe and easy.

Conceptpower DPA 120 UL and DPA 240 UL systems are designed to secure continuity of critical operations for small to mid-sized data centers, server rooms and other IT applications. It also protects industrial automation processes, healthcare facilities and many other vertical markets where operations are of a critical nature.

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**Maximized availability**

**Key benefits**
- 99.9999% availability
- Decentralized parallel architecture
- Replace or add modules with no downtime
- Short mean-time-to repair
- Eliminates single points of failure

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**Low total cost of ownership**

**Key benefits**
- True online efficiency: 208/120V up to 94%
- 415/240V > 95% at nominal load
- Small footprint/high power density
- Unity power factor (kW = kVA)
- Low input harmonic distortion (THDi < 4%)

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**Cost effective “right-sizing”**

**Key benefits**
- Vertical and horizontal scalability
- Pay as you grow

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**Efficient service concept**

**Key benefits**
- Simple power upgrade
- Fast service – low MTTR
- Reduced spare parts needed
- Online-swap modularity (OSM)
- Online serviceability
The Conceptpower DPA 120 UL and DPA 240 UL UPS systems deliver power protection from 20 to 600 kW at 208 V or 40 to 1.2 MW at 415 V (one to six modules) in a single cabinet frame. Horizontal scalability is also given, with up to five frames in parallel, to increase total power up to 600 kW or 1.2 MW respectively. This scalability means that there is no need to over-specify the original configuration as power modules can simply be added, as needed, in the future.

**Total vertical and horizontal scalability**

In a data center, power distribution systems have historically been oversized to meet the redundancy requirements. The Conceptpower DPA 120 UL and DPA 240 UL UPS systems are designed for datacenters and other high availability applications that require redundant configurations (for example N+1, 2 (N+1), etc.). Adding redundancy for increased availability comes easy with the advanced scalability within the Conceptpower DPA UPS family. These systems complement and complete the datacenter power distribution system for ABB, providing customers with a centralized power protection solution.

**Options**
- Battery monitoring
- Seismic bracing
- Maintenance bypass cabinet
- Control and monitoring (Modbus RS-485, Modbus TCP/IP, SNMP, Bacnet and others)
- Line-and-match battery cabinets

**Basic system configuration**

**The module includes:**
- 20 or 40 kW, depending on voltage
- True online double conversion UPS
- Built-in modular isolation
- Built-in backfeed protection
- Individual module display
- HMI interface with mimic diagram and LCD providing information in five languages

**The frame includes:**
- 120 or 240 kW rated power in single frame
- Bottom cable entry (standard)
- Rectifier, bypass terminals (single or dual-input mains connection available) and UPS output terminals
- Battery breakers and output switches for each module set
- Graphical color touch screen system display
- Communication interfaces: RS-232 and USB ports, I/O dry contacts (e.g. EPO, GEN On) and external bypass interlock

**6 x 5 x 20 kW = 600 kW**

or

**6 x 5 x 40 kW = 1.2 MW**
# Technical specifications

<table>
<thead>
<tr>
<th>GENERAL DATA</th>
<th>Conceptpower DPA 120 UL UPS</th>
<th>Conceptpower DPA 240 UL UPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>System power range</td>
<td>20 kW–600 kW @ 208 V</td>
<td>40 kW–1.2 MW @ 415 V</td>
</tr>
<tr>
<td>Nominal power/module</td>
<td>20 kW @ 208 V</td>
<td>40 kW @ 415 V</td>
</tr>
<tr>
<td>Nominal power/frame (capacity)</td>
<td>600 kW</td>
<td>1.2 MW</td>
</tr>
<tr>
<td>Output power factor</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Topology</td>
<td>Double conversion, transformerless, modular, Decentralized Parallel Architecture</td>
<td></td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>Up to 6 modules in one frame/up to 5 frames in parallel</td>
<td></td>
</tr>
<tr>
<td>Cable entry</td>
<td>Bottom</td>
<td></td>
</tr>
<tr>
<td>Serviceability</td>
<td>Front access only</td>
<td></td>
</tr>
<tr>
<td>Back-feed protection</td>
<td>Built-in (standard)</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>5-wires, 3-phase + neutral + ground</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INPUT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage</td>
<td>3 x 208/120 V + neutral + ground</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>&lt; 100% (~15%, +10%), &lt; 80% (~20%, +10%), &lt; 60% (~30%, +10%)</td>
</tr>
<tr>
<td>Input distortion THDi</td>
<td>&lt; 4% at 100% load</td>
</tr>
<tr>
<td>Frequency range</td>
<td>50/60 Hz ± 5%</td>
</tr>
<tr>
<td>Power factor</td>
<td>0.99 @ 100% load</td>
</tr>
<tr>
<td>Walk in/soft start</td>
<td>Yes</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>OUTPUT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated output voltage</td>
<td>3 x 208/120 V + neutral + ground</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 2.5%</td>
</tr>
<tr>
<td>Voltage distortion THDv</td>
<td>&lt; 2% in linear mode</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
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</table>

<table>
<thead>
<tr>
<th>EFFICIENCY</th>
<th></th>
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<tbody>
<tr>
<td>AC-AC</td>
<td>Up to 94% at nominal load</td>
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</table>

<table>
<thead>
<tr>
<th>ENVIRONMENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection rating</td>
<td>IP 20</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>−25° to +70°C</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0° to +40°C</td>
</tr>
<tr>
<td>Altitude (above sea level)</td>
<td>1000 m without de-rating</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BATTERIES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of 12V jars/string</td>
<td>25 – 35 jars</td>
</tr>
<tr>
<td>Types</td>
<td>VRLA, NiCd</td>
</tr>
<tr>
<td>Battery charger</td>
<td>Decentralized charger in each module set</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMUNICATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>User interface</td>
<td>Graphical touch screen (one per frame as standard) Decentralized LCD + mimic diagram (one per module as standard)</td>
</tr>
<tr>
<td>Communication ports</td>
<td>USB, RS-232, voltage-free contacts, SNMP (optional)</td>
</tr>
<tr>
<td>Customer interface</td>
<td>Remote shutdown, gen-set interface, external bypass contact</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPLIANCE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>UL 1778 5th edition, CSA C22.2 No. 107.3-14 Third Edition</td>
</tr>
<tr>
<td>EMC</td>
<td>IEC/EN 62040-2 C3</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>ISO 9001:2008</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT, DIMENSIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (System with 6 modules)</td>
<td>1517 lbs. (688 kg)</td>
</tr>
<tr>
<td>Dimensions WxHxD</td>
<td>31.16&quot; x 77.76&quot; x 35.17&quot; (791 x 893 x 1975.5 mm)</td>
</tr>
</tbody>
</table>

Note: Please refer to ABB’s Conceptpower DPA 120 UL and DPA 240 UL UPS technical documents for configurations, features, recommendations and guidelines.
In search of the perfect UPS

Data center managers long for the trifecta of perfect data center power: 100% available, noise-free, no UPS losses - and they're getting closer.
Perfect power is the dream of every data center manager: Always on, no noise or other issues that could cause server problems, and no efficiency-robining losses. UPSs can largely provide the first two, but at the expense of the third. Recent technology advancements are moving the UPS closer to realizing all three traits. These advancements are driven by financial as well as environmental pressures.

UPS systems are much more efficient than they once were. A decade ago, efficiency was in the high 80% range. Those losses were a pretty costly toll to pay, but data center managers accepted them in return for reliable power. Most centers had an easy option to achieve losses in the neighborhood of 1%, but that option – Economy Mode (ECO) – created new risks.

**The Seldom-used ECO Mode**
In ECO mode, incoming power passes directly through the UPS. The servers run off utility power but are still protected in the event of an outage. While accountants love ECO mode, data center managers don't because of the increased risk. ECO mode passes through noise and other power issues that could create big server problems. When not in ECO mode, most if not all power problems are filtered, providing the servers with Grade A, clean, consistent energy.

Considering the higher efficiency of today's systems, ECO mode is even less attractive. Transformerless designs based on fast-switching, low-loss IGBT's have pushed the efficiency for a current-generation UPS close to 97%, even at low or partial loads.

**Efficiency versus Scalability**
Manufacturers continue to look for ways to eke out every last amp from their UPS technology, aiming to deliver 100% efficiency with filtered power. Having reached the practical limit for eliminating UPS losses, they are searching for new cost-saving opportunities. One is improved power scalability.

Data centers have traditionally been commissioned with a fully built-out power system, able to support its projected maximum load. However, that load usually isn’t reached for years. In the interim, the center operates with a wasteful, oversized power infrastructure.

**ABB recently launched a UPS that combines a high-efficiency topology – approaching 97%, comparable to other modern UPS systems – with a pay-as-you-grow, decentralized design that offers both high efficiency and scalability.**

**Dreaming of Perfect Power**
The dream of perfect data center power – scalable systems that are always available, noise-free, and 100% efficient – is likely to remain a dream. But manufacturers, including ABB, continue to relentlessly pursue this ideal that will help data center managers sleep better at night.

For more information on ABB's UPS options:

Web: [www.abb.com/ups](http://www.abb.com/ups)
Email: powerconditioning@abb.com
Full power for industrial applications

ABB’s rugged UPS PowerLine DPA.
For many industries the consequences of electrical power loss can be disastrous. Production lines may have to go through a complex and costly restart, expensive products may be ruined, valuable production time lost, process equipment damaged and safety issues may arise. As a reliable supply of clean power cannot be guaranteed by the grid, many enterprises turn to uninterruptible power supplies (UPSs) to ensure that their operations continue to run.

For critical industrial applications, ABB has now introduced the rugged PowerLine DPA UPS, built to withstand the rough conditions encountered in many industrial settings. PowerLine DPA is based on ABB’s proven decentralized parallel architecture (DPA) for UPSs. DPA is a modular architecture that, by its nature, provides not only the best availability but also the best serviceability and flexibility. Taken together, these features will deliver a low total cost of ownership (TCO) over the 15 years’ lifetime of the PowerLine DPA UPS.

There are few events more disruptive to a manufacturing or production process than a power disturbance. And power disturbances come in many guises. On top of total power outages, the voltage may sag or swell over short periods. It may also do so over longer periods – so-called brownouts or overvoltages. Moreover, there can be electrical noise on the line, or frequency variation or harmonics may appear in the voltage. Such events can result in data loss, production downtime, unavailability of essential services, risk to hardware, financial loss and safety concerns. For these reasons, most professional enterprises protect their power supply with a UPS.

However, a UPS can itself become a focus of reliability and availability concerns. This is why ABB has developed an architecture that ensures the very best UPS design in terms of availability, flexibility, cost and ease of use – DPA.

**DPA**

UPS systems with a centralized parallel architecture (CPA) have some degree of hierarchical, centralized control or hardware (eg, a static bypass). This makes CPA devices vulnerable should a failure arise on one of these centralized components; one fault can bring down the entire UPS. With DPA, on the other hand, the UPS is modularized and each module has all the hardware and software needed for autonomous operation: rectifier, inverter, battery converter, static bypass switch, backfeed protection, control logic, display, and mimic diagram for monitoring and control. A module’s output is not affected by failures elsewhere in the UPS. If one module is lost, the others take up its load. In other words, a multimodule system is fault tolerant and there are no single points of failure. Availability is maximized.

The only UPS elements common to all modules are contained in the mechanical frame that accommodates the UPS modules - I/O connection, customer interface signaling, maintenance bypass and a system display. These elements are noncritical for UPS operation.

Each UPS module has all the hardware and software it needs for autonomous operation; there are no shared critical elements.
DPA – serviceability
One major advantage of the DPA is that the modules can be swapped online, i.e., removed or inserted without the need to power down or transfer to raw mains supply and without risk to the critical load. This unique aspect of modularity directly addresses continuous uptime requirements, significantly reduces MTTR (mean time to repair), reduces inventory levels of specialist spare parts and simplifies system upgrades. Modularity pays off too when it comes to serviceability: local service personnel do not need special skills, visiting service engineers spend less time on site, and any risks of data or production loss are minimized.

DPA – scalability
As UPS power requirements change – if a new process line is opened, say – the modular nature of DPA makes it simple to add modules and increase power capability. This means the initial configuration does not have to be overspecified to cater for future expansion - modules are simply added (or removed, if power requirements shrink) when needed. In this way, the user only cables, powers and cools what is needed.

Power consumption is a topic of great concern for many operators and the energy savings made by the modular expansion approach over the service life of the UPS are substantial.

This online-swap technology, as well as having a significant impact on overall costs, can also help achieve so-called six nines (99.9999 percent) availability – a highly desirable target for installations in pursuit of zero downtime.

PowerLine DPA
ABB already markets power protection products that are based on DPA and the PowerLine DPA UPS is the latest addition to this product portfolio. The PowerLine DPA UPS is specifically designed to overcome the many environmental challenges faced when deploying such sophisticated electrical equipment in a rough industrial setting.
Survivability is crucial, so particular attention has been paid to physical robustness. PowerLine DPA's IP31 protection can easily cope with dust, water condensation, excessive humidity (up to 95 percent), corrosive air contamination and rough manhandling. The UPS is designed to operate in a temperature range of -5 to +45 °C. High priority has been given to safety and PowerLine DPA features a high degree of protection for users and maintenance staff. The device's compliance with the relevant standards - IEC/EN 62040-1 for general and safety aspects, IEC/EN 62040-2 for EMC and IEC/EN 62040-3 for performance and test - has been verified.

Real estate for electrical equipment is often a limited or expensive commodity. The PowerLine DPA UPS has not only a small footprint but also cable access at the front (top and bottom), which eliminates the necessity for rear access and the associated extra space this entails.

PowerLine DPA is an online double conversion UPS: The incoming AC is first converted to DC, from which the output AC is then synthesized – giving a clean sinusoid. These two conversion steps give rise to the 'double conversion' term and isolate the output voltage waveform from any disturbances on the input AC side.

The UPS is based on a pulse-width modulation (PWM) principle and uses power electronic components that reduce harmonic content in the input current to under 3 percent, thus decreasing any mains voltage distortion that might affect the operation of other equipment connected to the mains supply. Input/output isolation transformers can be installed inside the UPS to increase safety levels, and to provide galvanic isolation for the UPS and the downstream load. This might be necessary, for example, where the UPS AC input power comes from switchgear or a motor control center and shares bus connections with electrically noisy loads such as variable speed drives.

Step-up/down transformers are available to meet specific voltage requirements. In addition, PowerLine DPA has a high overload capacity and robust short-circuit capability, and is available with rated powers of 20 to 120 kVA. With input and output (three-phase) voltages in the range 220 to 415 VAC the UPS requires no onerous electrical installation considerations and is straightforward to service.

An anti-condensation heater, lifting eyelets, dust filters, IP42 protection, halogen-free cables and black start capability are some of PowerLine DPA's other features that are designed specifically for deployment in demanding industrial situations.

Battery bank
Most industrial processes will draw substantial amounts of power from a UPS. Therefore, PowerLine DPA is equipped with valve-regulated lead-acid (VLRA) or NiCad batteries to support autonomy times up to 10 h. Fast recharging is also catered for to get the UPS battery bank back up to operational levels as quickly as possible.

Remote monitoring
In a power fail situation, it is important for all relevant personnel to be quickly and fully informed of the system status. For this reason, the PowerLine DPA UPS can be supplied with relay boards and a network management card that provide connection to a DCS (distributed control system) or SCADA (supervisory control and data acquisition) system via SNMP, Modbus TCP or Modbus RS 485. These interfaces allow environmental monitoring, extensive alarm handling and dispatching, redundant UPS monitoring, integration of PowerLine DPA into multivendor and multiplatform environments and the supply of UPS data to Web applications.

Connectivity via interfaces such as Modbus and SNMP allows the UPS to be a part of the IoTSP (internet of things, services and people) too. This makes the UPS part of a network that enables industrial production systems to exchange information and interact. The IoTSP allows the UPS to work together with the process control system and makes UPS data available throughout the entire value chain and supply chain in real time. A presence on the network enhances the overall capabilities of data acquisition, operations, maintenance and advanced service.
Local control and metering are provided via a HMI (human-machine interface) consisting of graphical display showing the UPS mimic diagram, UPS operating status (normal, battery and bypass), and programmable alarms.

A UPS for the future
The guarantee of a continuous supply of clean power for their critical operations has become an essential prerequisite for the success of many enterprises. The PowerLine DPA UPS, designed to withstand the rigors of rough industrial environments, can provide this guarantee. PowerLine DPA’s modular architecture makes it simple to service or expand and because its online swapping attributes mean it never has to be switched off, first-class availability is achieved.

With its efficiency of up to 97 percent and unity power factor, the PowerLine DPA UPS offers improved efficiency and optimization of investment as well as ease-of-use and enhanced safety in a wide variety of industrial environments. Combined with ease of serviceability these characteristics means PowerLine delivers a very low TCO over the life time of the product.

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Power Protection

For more information on ABB’s PowerLine DPA:

Web: www.abb.com/ups
The advantages of ABB’s unique modular UPS architecture are now available for locations that are usually rough on electronic equipment. ABB’s PowerLine DPA UPS makes sure continuous, smooth power gets delivered to light industrial applications that are exposed to varying temperature, humidity or pollution levels. Each high-reliability, standardized PowerLine DPA module is self-contained and can be online-swapped without switching off – making routine maintenance safe and easy and cutting inventory costs. The compact design that takes up less real estate and that delivers superb energy efficiency saves even more. Keep up at www.abb.com/ups

Smooth power in rough places?

Certainly.

Power and productivity for a better world™
08. ABB wins back major Chinese manufacturer
Power protection for CSOT’s new flat panel display factory

10. DPA 500 bound for Nigeria
ABB’s Conceptpower DPA 500 modular UPS fits bill in Nigeria

15. North American debut
New DPA 500 UL 480V system unveiled

17. White paper
Preventing transformer saturation in static transfer switches

07. AVC-20 bound for Germany
ABB receives first order for PCS100 AVC-20

12. Three month payback for pharmaceutical manufacturing giant
ABB’s PCS100 AVC corrects voltage fluctuations at Apotex

16. Building the future in China
ABB provides power protection to new LEGO factory in China

18. SuperSwitch®4
Next generation static transfer switch redefines reliability
The Cyberex® PowerBuilt™ is a true online double-conversion industrial UPS designed to support the continuing demand from downstream refining and petrochemicals, upstream oil and gas, power generation, and the growing regulatory and safety needs of today’s industrial complexes. The PowerBuilt™ Series UPS is designed to UL 1778 safety and IEC 62040-3 performance standards; and therefore, it can be scaled to meet changing electrical requirements and is adaptable to the most stringent technical specification. www.abb.com/ups