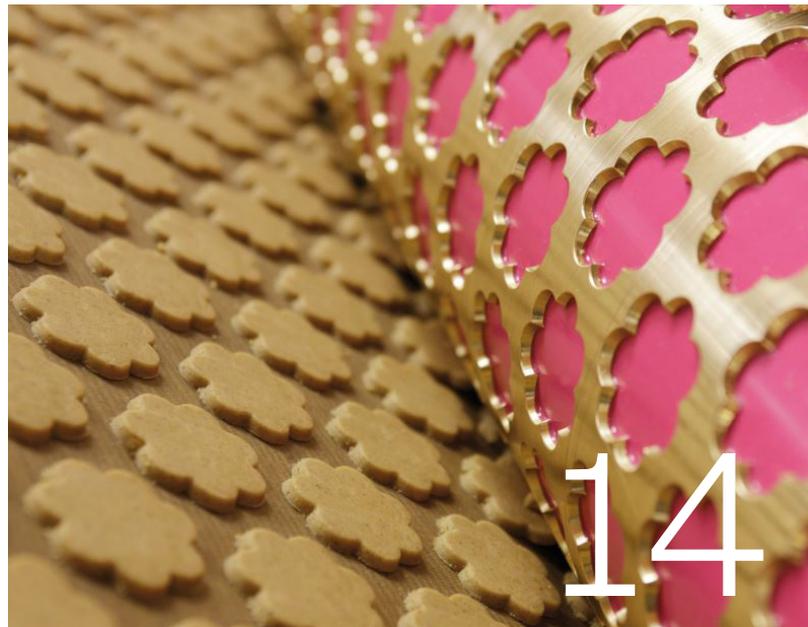


power

A power protection
magazine of the
ABB Group

02|2018



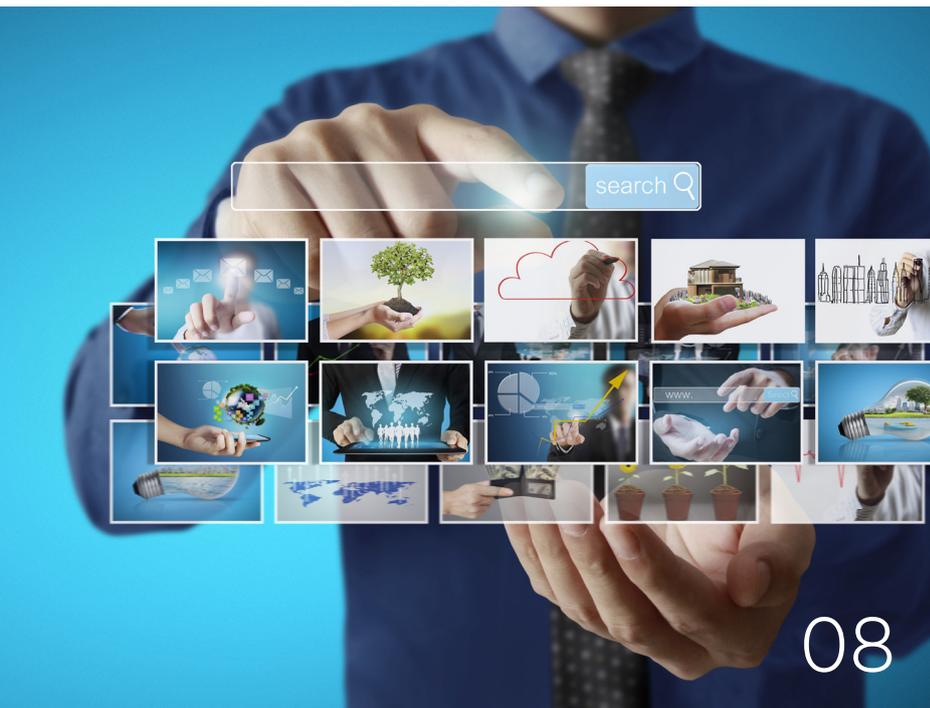
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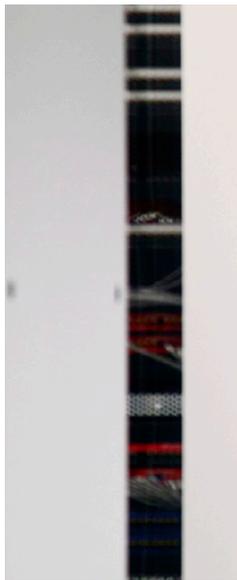
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EDITORIAL



Dear reader

Welcome to this issue of **power** where you will find all the latest news on ABB's power protection products and services. In this issue you will see the team has been very busy, both on new product launches and applying our leading technology to a variety of industries to improve their productivity.

The recently launched PowerValue 11T G2 is an example of the continuous development and technology leadership ABB brings to power protection. With ratings up to 30 kW, this double conversion single phase UPS brings some of the technology employed in ABB's larger UPS products to the lower power range. This really underlines the depth of the product offering available from ABB for power protection, from single phase UPS all the way up to medium voltage megawatt level UPS systems, we will have the product to solve your problem.

As the Global Product Line Manager for power conditioning, responsible for the PCS line of products, it is good to see further new applications for our PCS100 AVC-40. For many years now we have been a supplier of choice for power protection of LCD and LED flat panel manufacturing processes. Now we are extending on the supply chain of display manufacturing and providing equipment to suppliers into this industry, such as AGC Glass as described in this issue. Although at the glass stage the display panel does not have as much added value as a manufactured LCD panel, the return on investment provided by voltage conditioning with the PCS100 AVC-40 is still positive.

Another industry where power protection provides a clear value proposition is food and beverage. In this issue we describe how ABB is working on a remote monitoring solution for a specific food and beverage customer and how this provides benefits to this user. Related to the topic of remote monitoring is the work going on around integrating our power protection products with the capabilities of ABB Ability™. This is a really exciting space where thanks to the technologies now available we are able to improve the user experience with our products. Using data analytics to make decisions that can improve product availability and reduce costs thanks to smart maintenance regimes will bring significant benefits to our customers.

Enjoy this issue of **power**.

Perry Field
Global Product Line Manager
Power conditioning products

ABB launches PowerValue 11T G2 single-phase UPS aimed at applications up to 30 kW

ABB extends UPS portfolio to lower power applications, delivering a future proof design and an energy efficient supply of clean power

01 PowerValue 11T G2

02 ABB's PowerValue 11T G2 guarantees up to 30 kW of clean, reliable power for critical single-phase applications such as workstation clusters.

ABB's PowerValue 11T G2 now brings the benefits of ABB's sophisticated UPS technology to lower-power applications. Designed for single-phase applications, the PowerValue 11T G2 employs ABB's double conversion technology: incoming AC is first converted to DC, from which the output AC is then synthesized – giving a clean sinusoid.

These two conversion steps give the term “double conversion” and isolate the output voltage waveform from any disturbances on the input AC side. In other words, the PowerValue 11T G2 not only guarantees power to the critical load but guarantees that the power is always clean, whether the UPS is switched-in or not.

The tower-only PowerValue 11T G2 saves costs by minimizing energy losses with its best-in-class double conversion efficiency of up to 98

percent. Further efficiency is achieved by voltage and frequency independent (VFI) mode, in which the UPS activates and deactivates modules to match load requirements, thus saving energy and improving system efficiency especially in low-load conditions.

Simple to install and maintain, inexpensive to run and with a highly compact online UPS footprint, the PowerValue 11T G2 provides stable, regulated, transient-free, pure sine wave AC power with extremely tight output voltage regulation. Up to three 10 kW units can be connected in parallel to provide redundancy or to boost power delivery up to 30 kW. The hardware for paralleling comes installed. Up to four optional external battery modules (EBMs) supplement inbuilt batteries to extend runtime to over two hours (at 100 percent load at nominal power factor).



01

Gabriele Poccia, Product Manager for ABB Single-Phase UPS Product Line says: “ABB is now implementing additional UPS technology in lower-power products and this is having a very positive impact on our single-phase market. With the addition of the PowerValue 11T G2, we are rounding out our portfolio and offering owners of server rooms, ad displays, vending facilities, security gates and the like the opportunity to install a top-class, low-power UPS product for their application.”

For further information:

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Product Manager, Single-Phase UPS,
ABB Power Protection SA

02



Active voltage conditioner protects process quality at a leading electronics manufacturer

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01 Stock image | abstract glass

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02 Stock image | display screen

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03 QR code for www.abb.com/ups

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04 QR code for PCS100 AVC-40 product webpage

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05 PCS100 AVC-40

ABB's active voltage conditioner (AVC) system, the PCS100 AVC-40, boost quality and productivity at AGC Display Glass, a major supplier of glass substrates for display technologies. The technology protects sensitive industrial production processes from the disruptions and damage caused by voltage fluctuations in the utility power supply.

Voltage sags and surges are the most common cause of plant malfunctions in advanced manufacturing facilities with high levels of precision automation. Without power protection, such significant disruptions can occur 12-18 times a year. Eliminating lost production due to down time and related quality issues can transform the competitiveness of a facility.

01



ABB's compact design makes it easy to install in machine rooms or other confined spaces, freeing up floor space. Its minimal heat emission means energy efficiency exceeds 98 percent and cooling requirements are lowered.

AGC Display Glass of Shenzhen City, China, is one of the world's leading producers of glass substrates. Their technologies are used in a huge range of thin film transistor (TFT) displays, liquid crystal displays (LCDs) and organic LEDs. The company's advanced manufacturing methods are key to its global competitiveness.



03



04

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PCS100 AVC-40

Superior voltage conditioning for commercial and industrial applications

The PCS100 AVC 40 designed for sag correction in large commercial and industrial applications. Available in ratings from 150 kVA to 3600 kVA, the PCS100 AVC-40 offers continuous protection from the most common utility voltage problems found in modern power networks. Failsafe, worry free operation even in harsh electrical environments and a faster return on investment due to low operation costs will ensure your business is protected from power quality events. abb.com/ups



How ABB keeps the food & beverage industry running without a hiccup



Bruce Bennett
Global Channel Manager
Power Conditioning

In our homes, electrical power interruptions are annoying, but they rarely cause financial losses. For industrial operations, however, power problems can lead to millions of dollars of unnecessary costs and -much worse-dangerous health situations. These potential consequences are especially troubling for the food and beverage industry.

Modern food and beverage manufacturers rely heavily on technology and high-speed continuous processes to reduce production time and the cost of bringing goods to market. Technology-based systems improve quality and flexibility while reducing variability.

Power-supply disturbances can interrupt the operations of the precision machinery used in food and beverage production, resulting in lost material, loss of certain production units, non-delivery and hours spent clearing and cleaning equipment to restart. Even a momentary interruption in a process may cause contamination issues, which can be an expensive problem to solve. Unscheduled process interruptions can produce long delays as the process may have to be restarted.

In the dairy industry for example, any unexpected downtime can cause spoilage resulting in the dumping of valuable milk products. Lost

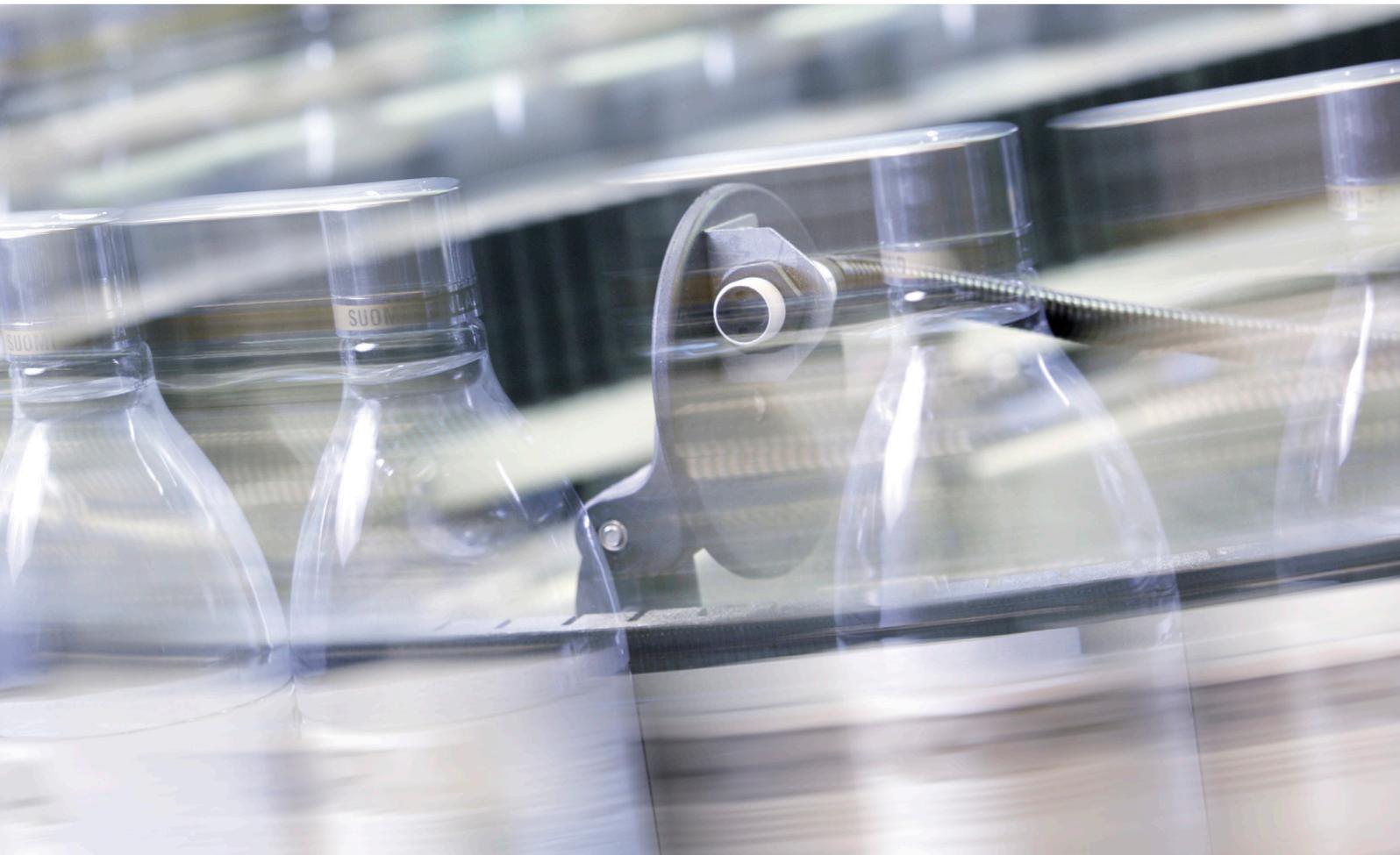
production time, while more milk is sourced and sterilized, can cost many hours and many thousands of dollars.

Instantaneous prevention of power interruptions

Fortunately, the latest power technology can prevent these interruptions from happening. Installed between the incoming supply and equipment loads, the ABB PCS100 active voltage conditioner (AVC) senses power disturbances, such as a voltage sag from a weather event, and acts extremely quickly to correct the event before it can have any effect on critical machinery.

The PCS100 AVC constantly monitors the voltage supply and immediately corrects any impending issues. When a voltage anomaly is detected, the system instantaneously corrects the voltage, up or down, to the nominal level by means of a built-in injection transformer and rectifier/inverter pairs.

The PCS 100AVC draws additional energy from the utility to make up the correction voltage at sub-cycle speed, relying on ABB's leading-edge power electronics. Only one moving part—a cooling fan—is involved, and no batteries are required. The PCS100 AVC's footprint is extremely small, so it installs easily in equipment rooms and confined spaces.



—
01 Stock image |
bottles on a automated
processing line

Throughout the food and beverage industry processes that rely on continuity of operation can benefit from the PCS100 AVC system. It can save dollars, time and lives in such operations as baking, where the risk of fire exists if a loaded conveyor stops in an oven, or when gas-fired ovens and boilers do not automatically reignite. Packaging products, like glass and foil, have continuous processes that can cause long and expensive delays when disrupted. These operations can benefit from PCS100 AVC protection as well.

Financial losses from poor power quality can reach around 4 percent of a company's turnover, according to a Pan-European Power Quality Survey. Moreover, an unstable or fluctuating electricity supply can cause problems beyond unexpected interruptions. Here are some examples of problems that can be avoided by installing PCS100 AVC protection:

- Failure of such components as contactors, release switches and fuses
- Unexplained breakdowns, faults or malfunctions of machinery
- Overheating of transformers and motors, reducing their useful life
- Damage to computers, PLCs, sensors and other precision equipment
- Communication interference in electronic sensors and devices
- Higher distribution system losses
- Light flickering

ABB is the global leader in voltage sag and surge protection, with proven technology operating successfully with heavy industrial load profiles in the world's worst supply networks. We are dedicated to delivering advanced, reliable solutions that will provide a stable, high-quality power supply for many years.

Reliable and safe power supply for biscuit production guaranteed

Romania's S. C. Croco safeguards its increased food-production capacity with more uninterruptible power supply units from ABB

For many years ABB has been supplying equipment to the food and beverage industry. ABB has invested in extensive R&D and customer collaboration to launch products, solutions and services that help the industry become safer and more efficient. In fact, as part of its Next Level strategy, ABB is placing special focus on this sector to support customers achieve their sustainability, operational and financial targets. By embracing digitalization, customers will benefit daily from predictive, condition-based maintenance, with a focus on reliability.

A significant example of this close collaboration with the industry was demonstrated by an order for an uninterruptible power supply (UPS) system from S. C. Croco S.R.L. in Romania. CROCO S.R.L. is the Romanian leader for such well-known biscuit products such as Brezel, Crackers, Sticks and Petit Beurre and has been established in the market since 1994.

Cristian Bucur, managing director for ABB's Romanian UPS channel partner, Power Back-up Services S.R.L., explains: "Croco invested 6 million euros in 2014 and 2015 to ramp up its biscuit production capability to 93 tons per day. In 2017, the company planned a new investment of 8 million euros to expand the production facility. The factory currently employs more than 400 people to keep this 24-hour, three-shift production going. But, customers seem to have a very sweet tooth, and increasing demand led Croco to decide to double production capacity, with concomitant requirements for more electrical power and associated power protection measures."

01





—
01 PowerWave 33
—

02 The maximum production capacity is 93 tons per 24 hours of biscuit products such as Brezel, Crackers, Sticks and Petit Beurre.

Croco's production was operating with two power distribution transformers fed from two different power lines. Both of these power feeds were on the same public grid, which meant any problems - such as blackouts or power surges - could knock out the entire biscuit production line. This was a potentially expensive issue, since unfinished goods must be thrown away and the production line must be reset and restarted. Not only that, but 30 to 60 minutes' worth of production could be lost.

In 2014, the customer had already installed two ABB 400 kW PowerWave 33 UPS devices in parallel configuration to ensure a reliable supply of clean power to the original production line. Now, with production doubling, this power safeguard needed to be enhanced. For that reason, Croco purchased two more 400 kW PowerWave 33 parallel systems from ABB. Each UPS is equipped with two strings of 50 battery blocks with 100 Ah batteries and DC independent breakers are used for each battery string.

02

The new units had to be installed in the same room as the original UPS, where space was very limited. This situation required the engineers to design a special Kunstmann battery cabinet and resize the previous UPS devices to create more space. The small footprint of the PowerWave 33 also helped matters.

To help Croco embrace digitalization and benefit from predictive, condition-based maintenance, ABB is working on a UPS remote monitoring solution specifically for this customer.

Bucur concludes: "Discussions started in March 2017, the contract was signed in August, and the job was all done by mid-November! The customer had chosen ABB because of his very good experience with the previous installation, especially with ABB's local partner. Croco can continue now to rely on the same technology, which is superior in terms of efficiency, quality and service. Additionally, the small footprint of the ABB PowerWave 33 and the customized DC battery cabinets were key selling points during negotiation."

In all, Croco now has 1.6 MW of backup power, and the consumer's supply of biscuits is guaranteed.

ABB Ability™ enhances power protection device monitoring

Power disturbances have many manifestations: blackouts, voltage sags or swells, noise, frequency variation or harmonics

—
01 Mr. Luca Ceppi, Chief Information Officer at Elemaster

Power disturbances come in different shapes: they come as blackouts, as voltage sags or swells, as noise, as frequency variation or as harmonics. Disturbances in every shape – are a problem for installations where reliable power availability is critical such as data centers, financial institutions, hospitals, government departments. Power disturbances and outages are mainly eliminated by a so-called dependable uninterruptible power supply (UPS).

Because the UPS is such a crucial part of the IT infrastructure, it is essential to monitor its condition round-the-clock. Why use it if it fails at the moment when it is needed the most? In many cases, the impact of a UPS failure can be catastrophic. Clear visibility of the power system's status is essential. This is why ABB provides intelligent solutions that monitor the power protection status to ensure that for example data storage equipment or control and manufacturing processes continuously receive clean, reliable power.

Part of the monitoring scheme, for example, involves ABB environmental sensors. They provide data which can be displayed alongside other UPS status information to give users clear, real-time data and an event log. In case of a power failure, battery autonomy is monitored.

Monitoring devices provide real-time condition information and help identify potential problems before they could have a severe impact. For

example, power downtime may threaten to exceed battery autonomy and it is essential that relevant staff is fully aware of this fact as soon as possible so that remedial action can be taken. They can receive alerts via text messages, e-mails, pop-ups and mobile messages.

The ABB Ability cloud presents an opportunity for a major change in the way power protection equipment is monitored. The cloud:

- Is a scalable and secure platform.
- Provides virtually unlimited memory space and computing power, making data storage and analytics easier.
- Allows the UPS owner to transfer and store encrypted data in an absolutely secure way. In fact, the cloud often provides superior data security compared to local IT solutions. Cyber security is a topic close to ABB's heart and one in which the company invests a lot of time and effort.
- Permits the customer to be master of his own data and choose with whom he wants to share it. Different access levels can be defined, which ensures people see only what they are supposed to.
- Is diagnostic and prognostic.
- Provides service on demand.
- Allows edge analytics – i.e., applying local analytics algorithms to the live stream of data directly inside the UPS without sharing confidential information with the outside world.



01

ABB has fully embraced the almost limitless opportunities offered by the ABB Ability cloud with a Group-wide initiative that takes a huge step in connectivity: ABB Ability is a unified, cross-industry digital capability - extending from device to edge to cloud - with devices, systems, solutions, services and a platform that enables more knowledge of the system, more capabilities and improved performance delivered by the connectivity of ABB Ability enabled equipment.

ABB's power protection solutions have already incorporated ABB Ability. In fact, Elemaster - the first customer to install ABB's modular DPA 500 UPS, which has been protecting their production capability for four years - now benefits from the advantages of having their UPS integrated with the world of ABB Ability. By using the power of ABB Ability, their insight into system health will extend so that service engineers or other authorized personnel can access, not just the Elemaster UPS's current state but also life cycle status, technical data and documentation, service reports of previous maintenance, recommended services and other key data.

And it's easy: The simplicity of installation of the ABB Ability monitoring at Elemaster prevents the high cost and complex setup of a traditional energy monitoring and management system. In addition, once set up, it is possible to extend platform access to more users with specific roles, such as infrastructure operation staff and service personnel, in just a few clicks.

Mr. Luca Ceppi, Chief Information Officer at Elemaster says, "The connectivity and overview delivered by the new ABB Ability integration is great. It is now much simpler to obtain an insight into the power system - measurements and information on real-time status is all there, plain to see. This improvement in monitoring will reduce our risk of downtime and should mean less maintenance effort."

ABB has been advancing technologies for the IIoT (Industrial Internet of things) for more than a decade via its innovative control systems, communication solutions, sensors and software. Now, with ABB Ability, IIoT technologies have the even bigger potential to use data intelligently to optimize UPS operation, bringing the highest customer benefits. New, enhanced cloud-based monitoring capabilities will provide ABB's UPS customers with more oversight, better service and, most importantly, peace of mind.

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.

01 Conceptpower DPA 500

02 Stock image | Data Center

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-robbing losses. UPS' can largely provide the first two, but at the expense of the third. Recent technology advancements, though, 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. Transformer-less 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.

UPS manufacturers have responded with scalable, modular systems that enable rightsizing to the current load. Most of those systems are based on a legacy, centralized design that includes several single points of failure. The tradeoff of more scalability at the cost of lower reliability makes many center managers uncomfortable.

ABB 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

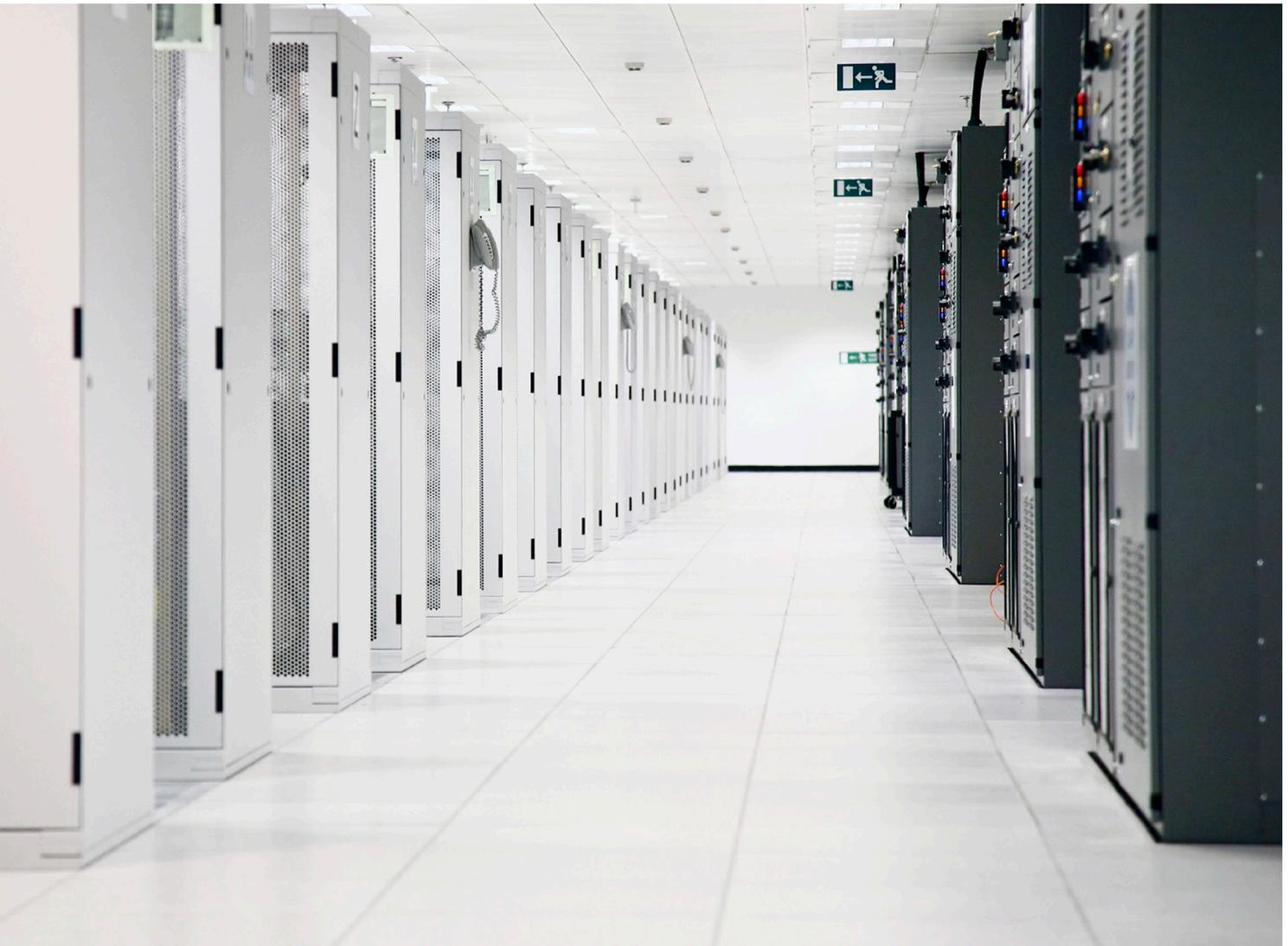
The dream of perfect data center power – scalable systems that are always available, noise-free, and 100% efficient – is likely to remain a dream. But manufacturers, including ABB, continue to relentlessly pursue this ideal that will help data center managers sleep better at night.

To learn more visit the UPS website: [link](#)



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Power Conditioning

Designed for commercial
and industrial applications.

By choosing from ABB's PCS100 power conditioning solutions you are selecting from a portfolio of advanced technologies and expertise. This power conditioning product range includes the Active Voltage Conditioner, Reactive Power Conditioner, Static Frequency Converter and low and medium voltage UPS's. A unique line up giving superior value to operations in the industrial, utility and commercial sectors. Providing energy efficiency, high reliability and increased productivity. abb.com/ups

