
INTERVIEW

The Importance of Power Protection in the Food and Beverage Industry

An interview with Bruce Bennett, Global Channel Manager, Power Conditioning



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The way we process and package our food has undergone a huge change. With these changes, a high quality of electrical power is more critical than ever for the food and beverage industry. Companies must carefully consider their approach to power protection to avoid huge losses.

In this interview, Bruce Bennett, Global Channel Manager, from ABB's Power Conditioning team, talks about why power protection is hugely important to the food and beverage industry.

Why is power protection important to the food and beverage industry?

The physical consequences of power interruptions are obvious when they occur, but what really matters to the food and beverage business is the financial cost of power interruptions. The Pan-European Power Quality Survey[1] concluded annual losses attributed to power quality issues may amount to 4% of the business turnover. For many, this loss runs to tens or hundreds of millions of dollars annually, but is mostly preventable!

Modern food and beverage manufacturers rely more than ever on technology based systems, machinery, and high speed continuous processes to reduce the time and cost of bringing goods to market, improving quality by reducing variability, while increasing specification and volume flexibility.

Disturbances on the power supply to this precision machinery can result in unscheduled interruptions that can be very costly in terms of lost material, production units, non-delivery, and hours spent clearing and cleaning to restart. Even a momentary interruption of a process that then requires addressing a possible contamination issue can be very expensive.

High quality of electrical power is critically important. How can ABB's range of power

conditioning systems protect food and beverage facilities from disturbances in electrical supply?

Simply put, the ABB PCS100 power conditioning system senses a power quality event, such as a voltage sag, and acts extremely quickly to correct the event before it can have any effect on the customers' critical machinery. We do this with equipment installed on the customer's premises upstream of the electrical supply to critical loads, and monitor the electrical voltage supply to the load. When a voltage supply error is detected the PCS100 corrects it so fast that machinery connected downstream continues to operate without interruption.

Tell us how ABB's products can help processing and packaging applications in the food and beverage industry?

Automation plays a key role in high speed, high volume processing and packaging applications. Typically this machinery has very sensitive electronics and fast moving motors, and also relies on a very high level of synchronisation between operations upstream and downstream. Mishaps can cause unexpected downtime throughout the entire operation. ABB's PCS100 product range delivers the clean, stable power supply necessary for correct operation of automated machinery.

Why is stable power quality a vital component for dairy applications?

Because production of milk is time critical, any unexpected downtime in processing can result in dumping of valuable product. Machinery may become blocked or require clearing of product or packaging. As a result, and due to the extremely high hygiene requirements, lost production time while sterilising takes place can be many hours and cost many thousands. The PCS100 AVC minimises the risk of unscheduled interruption to processes in dairy applications by ensuring a high quality, stable voltage supply is delivered to the site at all times.

What are the consequences of ignoring power quality?

As mentioned earlier, the most concerning consequence is a financial loss. Around 4% of a company turnover can be attributed to poor power quality. This can be in lost product, time, damage to machinery, and increased maintenance costs.

An unstable or fluctuating electricity supply can not only be the cause of unexpected interruptions, but may also be observed throughout the factory as:

- Failure of components such as contactors, release switches, fuses etc.,
- Unexplained breakdowns, faults or malfunctions of machinery,
- Overheating of transformers, motors, etc. reducing the useful life,
- Damage to precision equipment (computers, PLC's, sensors, etc.),
- Communication interference in electronic sensors and devices,
- Higher distribution system losses, or
- Light flickering.

How is ABB's PCS100 AVC a solution to poor power quality?

Typically, the PCS100 AVC is installed on the customer premises between the incoming supply and the critical loads. The incoming supply voltage is continually monitored so that when a voltage disturbance is detected, the PCS100 AVC reacts with extreme speed to correct the voltage, up or down, to the nominal level by means of the inbuilt injection transformer and rectifier/inverter pairs.

The PCS100 AVC draws additional energy from the utility to make up the correction voltage at sub-cycle speed thanks to ABB's leading edge power electronics, which means only one moving part; the cooling fan. Requiring no batteries, the footprint is extremely small and is easily installed in equipment rooms or confined spaces.

What are the benefits of PCS100 AVC?

Perhaps the biggest risk too many food and beverage companies is the risk of non-supply downstream due to unscheduled process interruption, and long delays to restart and catch-up. No matter where in the world, or how modern it is, all electricity networks will suffer some power quality issues to some degree. The PCS100 AVC minimises the risk of production delays and maximises uptime.

Additional information

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Research shows that over 90% of power quality events that cause industrial equipment malfunction are a voltage sag, where the supply voltage drops markedly for a very brief period. Most voltage sags are caused by external factors, such as weather events, e.g. high winds, heavy rain, or snow and ice build-up, traffic accidents and construction works.

The PCS100 AVC is designed to work in electrical supply networks throughout the world. With robust industrial design the PCS100 AVC-40 has a very high overload capability for the harshest of factory electrical loads and protects all the components of a critical process load including conveyors, pumps, fans, or other motors, plus the control electronics, sensors and other devices necessary to keep the process running.

Are there any other food and beverage applications that will benefit from ABB's PCS100 AVC system?

Any process that relies on continuity of operation can benefit from the PCS100 AVC system. In addition to the examples above are such operations as baking where there is a risk of fire if a loaded conveyor stops in an oven, or where gas fired ovens and boilers do not automatically reignite costing valuable downtime.

Other businesses that supply food and beverage manufacturers can also benefit, especially when the time critical nature of the supply chain is considered. Packaging products such as glass, foil, and other specialty packaging products all have continuous processes that can cause long and expensive delays. These industries can also benefit from the PCS100 AVC system protection.

What does ABB's technology mean for the future of the food and beverage industry?

The PCS100 AVC provides the food and beverage industry surety of high quality, stable power supply no matter where in the world the operation is. ABB is the industry leader in voltage sag and surge protection with proven technology that continues to protect many businesses, with heavy industrial load profiles in the worst supply networks in the world.

ABB's power conditioning products are continually being improved and we are dedicated to delivering advanced, reliable solutions to our customers that will provide a stable, high quality power supply for many years.

[1] The Cost of Poor Power Quality, ECI Publication No Cu0145, October 2015