



Application brochure

Power protection solutions Food and beverage industry

Power and productivity
for a better world™



Power protection

Why power protection is important for food and beverage businesses



The way we process and package our food has undergone a revolution with high levels of automation, monitoring and information systems. This has been driven by not only productivity improvement, but also by a host of food safety requirements. Due to the high degree of automation, such facilities are very sensitive to power quality events.

With these changes, a high quality of electrical power becomes business critical. This means food and beverage companies must carefully consider their approach to power protection. Power outage, sags or other voltage disturbances can result in tripping or failure of critical equipment.

Depending on the particular process costs relating to product loss and downtime can be significant.

ABB's power protection product portfolio consists of a compressive range of UPSs and power conditioners that can protect a food and beverage facility from disturbances in the electrical supply. With power protection from ABB in place, food and beverage product quality, safety and production can be maximized, ensuring maximum utilization of your facility and enhanced product quality to the customers.

ABB's power protection solutions can be applied to any application in the food and beverage process



Processing – typical applications

Picking: With increasing automation in picking processes, stable power is required. The installation of UPS on control equipment can eliminate waste and increase output.

Mixing: Mixing requires precise control to ensure consistent product quality. Mixing machines often have high starting torque and often operate at different mixing speeds. This can cause undesired voltage fluctuations within a facility, affecting sensitive equipment connected to the same power supply. Control of the power factor minimizes voltage fluctuations and penalty charges from the power utility.

Sterilization: Food safety is of paramount importance, and so sterilization is a key element of nearly all food and beverage processes. Pasteurization, cooking and Ultra High Temperature (UHT) treatment rely on continuous clean power. Temperatures must be accurately controlled and often recorded to verify sterilization effectiveness. Any power event or interruption that impacts the sterilization process or temperature recording, can result in lost product. Costs can be significant with the disposal of waste product and the extended time it can take to clean the system prior to recommencing production.

Packing – typical applications

Conveying: Increased automation means conveyors of increased speed and complexity are being utilized. Bottling would be a typical example. Interruptions are usually caused by voltage fluctuation causing sensors, drives or controls to malfunction. Beside the physical damage to product or tools, it also causes time-outs for cleaning or repair work.

Filling: Filling machines designed to fill dry mixes, liquid or thin food products can be subject to voltage sags. Eliminating these common power quality problems can help filling machines achieve continuous output and reduce product waste.

Packing: Packing is a number of fully automated processes executed at high speed. They may include product separating, weighting, vacuuming, and freezing. Disruptions to packing results in product loss, poor quality and potential health risks if the packing is compromised.

Palletizing: Often a highly automated process and the final stage after packaging. Robots are widely used and they require good quality power for continuous operation. Data records from the batches must be securely collected and stored.

ABB's UPS and power conditioning systems offer reliable and efficient performance

Power protection is now made easy

ABB's power protection portfolio is a unique line up of UPS and power conditioning products designed to solve power quality issues for food and beverage applications.

Outage protection



Features

- Commercial and industrial UPS options
- Modular true online double conversion UPS
- Industrial UPS in small and high power
- Energy storage options according to users needs

Benefits

- 100 percent availability of critical control systems
- Security of product data records
- Ensure safety compliance for critical processes

Voltage conditioning



Features

- Industrial design with rugged overload capability
- Modular design providing high reliability
- Redundant internal bypass
- No battery energy storage required

Benefits

- Continuous protection from common utility voltage problems found in modern power networks
- Failsafe worry free operation even in harsh electrical environments
- Faster return on investment due to low operation costs

Reactive power conditioning



Features

- Inverter based high speed power factor correction
- 5th and 7th harmonic cancellation
- Current imbalance correction

Benefits

- Save money on utility reactive power charges
- Process performance increased with improved voltage quality
- Low maintenance and operating costs
- Reduce loads, loss and heating on supply transformers

Power protection segments

1. Application targeted power protection configuration

Main factory loads have a mix of connected equipment with greatly varying power protection requirements. These are

categorized into the following classes of loads and protected separately but in a centralized way.

Sensitive process loads

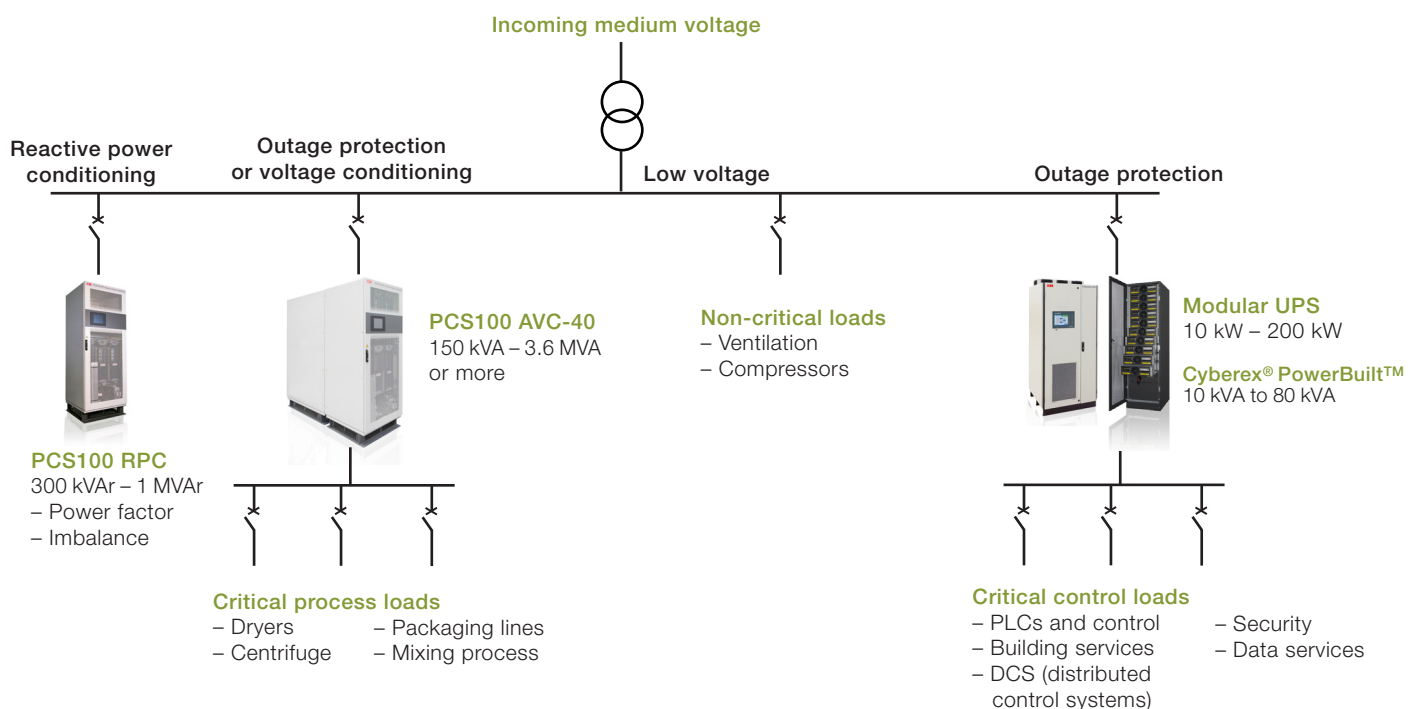
Active voltage conditioning protection or industrial UPS if outages are present

Non-critical

Loads that can trip or fail and then restart without impacting plant performance; do not need protection and can be separated

Critical loads

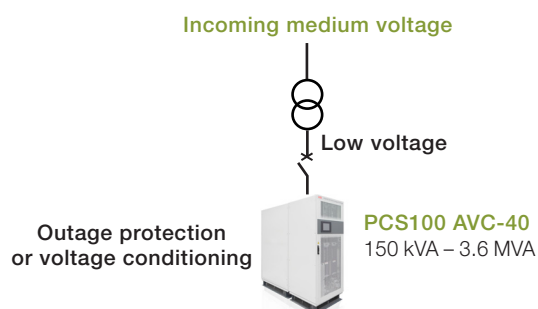
UPS protection



2. Centralized power protection configuration

In most developed countries voltage regulation is not an issue, but in developing countries the supply voltage can vary greatly and the level of voltage imbalance can be high. This is very problematic for industrial loads including direct on line connected motors and variable speed motor drives. Voltage regulation may be required to stabilize and regulate the incoming supply. Traditionally servo variac regulators

have been commonly applied, but now electronic voltage conditioners are available with higher efficiency and much faster performance. Many food and beverage processes are so sensitive that they require centralized power protection, even in locations with high quality electrical supply. This makes centralized power protection the standard approach wherever plants are located globally.



Power protection product overview



	REACTIVE POWER CONDITIONING	VOLTAGE CONDITIONING	OUTAGE PROTECTION		
	PCS100 RPC	PCS100 AVC-40	PCS100 UPS-I	Cyberex® PowerBuilt™	DPA UPScale ST
GENERAL DATA					
Power range	100 kVAr to 2 MVar	150 kVA to 3.6 MVA	150 kVA to 3 MVA	10 kVA to 80 kVA	10 kW to 200 kW
Voltage	380 – 480 V (Other voltages via transformer)	220 V – 480 V, 3-phase	220 V to 480 V	120V, 240V	380 V to 415 V
Applications	Any manufacturing processes and tools			Facility backup, DCS and PLC critical power for control systems	PLCs and control, building services, security, data services
EFFICIENCY					
Efficiency	97%	98%	99%	86%	96%
COMMUNICATION					
User interface	8.4" Color LCD touchscreen			10.4" VGA TFT LCD	Module level LCD display
ENVIRONMENTAL					
Enclosure protection	IP20 (optional IP21, IP42)	IP20	IP20 (optional IP21)	IP21 (optional IP41)	IP20
Operating temperature	0° – 40° C (up to 50° C with derating)	0° – 40° C (up to 50° C with derating)	0° – 40° C (up to 50° C with derating)	0° – 40° C (up to 50° C optional with derating)	0° – 40° C
STANDARDS AND CERTIFICATIONS					
Safety	IEC/EN 62103	IEC/EN 62103	IEC/EN 62040-1	UL 1778, CSA C22.2 no. 107.3-05 ANSI/NFPA 70	IEC/EN 62040-1
EMC	IEC/EN 61000-6-2, CISPR 11	IEC/EN 61000-6-2, CISPR 11	IEC/EN 62040-2	In accordance with IEC/EN 62040-2	IEC/EN 62040-2
Performance	–	IEC/EN 61000-4-34	IEC/EN 62040-3	In accordance with IEC/EN 62040-3	IEC/EN 62040-3
Quality	ISO 9001	ISO 9001	ISO 9001		ISO 9001
Marking	CE, UR	CE, UR	CE, UR	UL, CUL	CE

Protecting businesses on a global scale



Global applications

Processing

Agricultural: Keeping an agricultural processing plant operating and running efficiently can be an intricate challenge. Systems, equipment, facilities and infrastructure need to work together continuously to maintain and ensure uninterrupted operations. A global agricultural ingredient solutions provider entrusted ABB's PowerBuilt UPS to back up its distributed control system, ensuring continuous processing operations throughout the facility.

Sugar refining: ABB's PCS100 RPC is correcting dynamic power factor and harmonics on the DC drives used for sugar centrifuges at an iconic sugar factory.

Packing

Dairy: When a multinational dairy manufacturer Fonterra needed a power protection solution for its processing and packaging lines, ABB was able to provide an efficient and reliable power protection solution. The PCS100 AVC is eliminating voltage sags, cutting out over four power quality events annually, saving an estimated cost of \$200,000 per year. Additionally, Fonterra is using two PCS100 RPCs at another facility in order to correct the power factor and any harmonic imbalances.

Dairy: ABB's PCS100 UPS-I installed at Morningstar Foods in Washington DC, USA, is protecting a high speed milk packaging machine. Thunderstorms in the summer, caused the production lines to stop. Due to rules and regulations around dairy products, meant re-sterilizing the equipment, taking around four hours each time. The PCS100 UPS-I prevented voltage sags caused by these thunderstorms, eliminating downtime and wasted milk product.

Beverage: A bottling plant that consists of nine bottling lines requires a reliable power supply. ABB's PCS100 AVC was installed at the main supply point to the facility, in order to protect the plant from crippling voltage sags caused by thunderstorms in the summer season. Within the first three months of operation, the PCS100 AVC had protected the facility from 27 significant events.

Service and support

ABB's service portfolio for power protection is designed to increase your return of investment and keep the equipment operating at the highest efficiency and availability level throughout its entire lifetime.

As your service partner we ensure the overall support of ABB power protection portfolio throughout the entire life cycle. We are committed to the reliability of your operations. Which is why we make every possible effort to guarantee your power availability – no matter what happens on the power supply side.

We work closely with our research and development organization which enables us to develop the most advanced service for our product portfolio and ensure a pro-active product life cycle management.

What we offer

- Installation and commissioning
- Maintenance
- Repairs
- Spares and consumables
- Extensions, upgrades and retrofits
- Replacement
- Training
- Service agreements
- Advanced services

Contact us

For more information contact your local ABB representative or visit:

www.abb.com/ups

www.abb.com/food&beverage

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