APPLICATION BROCHURE

ABB Power protection solutions

Food and beverage industry

- Efficient power protection solutions specifically designed to solve power quality problems and stabilize networks.

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Utility network power events causing unscheduled process interruptions can be costly to the food and beverage industry.

ABB is a global leader providing power protection solutions for food and beverage to ensure continuous operation.

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Why power protection is important to the food and beverage industry

The way we process and package our food has undergone a transformation, with high levels of automation, monitoring and information systems. This has been driven by not only the improvement to productivity, but by a host of food safety requirements. Due to the increasing intensity of automation, food and beverage manufacturing plants are extremely sensitive to power quality events.

In modern plants, a high quality of electrical power is business critical. Food and beverage companies must carefully consider a power protection strategy, as power outage, sags or other voltage disturbances can result in tripping or failure of critical equipment.

Depending on the event and situation, costs relating to product loss, production downtime, or supply chain disruption can be significant.

ABB's power protection portfolio consists of a comprehensive range of UPS and Power Conditioning solutions 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 the greatest utilization of your facility and enhanced product quality to customers.

Typical applications

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

Processing

Picking
With increasing automation in picking processes, stable power is required. Protecting picking control equipment and processing machinery 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. Reactive power control minimizes voltage fluctuations and can help avoid 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. The sterilization process must be accurately controlled and often recorded to verify sterilization effectiveness. Any power event or interruption that impacts the sterilization process 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

Conveying
Increased demand means conveyors of increased speed and complexity are being utilized. Interruptions are usually caused by voltage fluctuation causing sensors, drives or controls to malfunction. Physical damage to product or tools, time-outs for cleaning or repair work can occur unexpectedly and may result in non-delivery

Filling
Filling machines for 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 automated processes executed at high speed. Including separating, weighing, vacuuming, and freezing. Disruptions to packing results in product loss, poor quality and potential health risks if the packing is compromised.

Palletizing
Robots are widely used, and they require good quality power for continuous operation. Data records from the batches must be accurately collected and stored. Disruptions can result in lost time to reset and restart processing, missed deliveries and wasted products.

Systems offering reliable and efficient performance

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

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

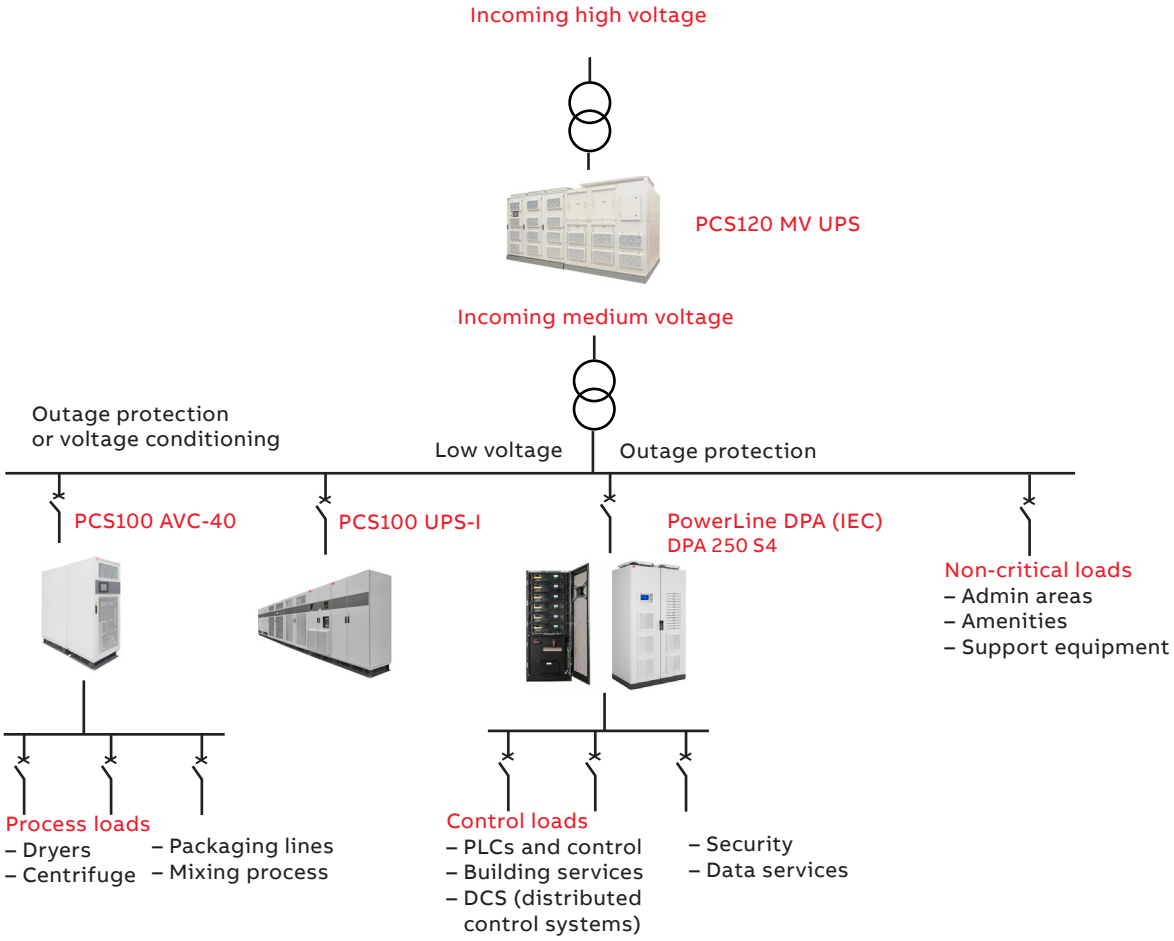
Features
Commercial and industrial UPS options
Modular true online double conversion UPS
Industrial UPS in small and high power
Energy storage options according to user needs

Voltage conditioning

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

Features
Industrial design with rugged overload capability
Modular design providing high reliability
Redundant internal bypass
Sub Cycle, active regulation of load voltage
No battery energy storage required

Solution oriented power protection



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:

Process loads
Active voltage conditioning (AVC) protection or industrial UPS (UPS-I) if outages are present.

Data, control and safety loads
UPS protection provides complete outage protection and longer run times.

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

Voltage stabilization and regulation
In developing countries, the supply voltage can vary greatly, and voltage imbalance can be high. This is very problematic for industrial loads including direct on-line connected motors and variable speed motor drives. It may be necessary to stabilize and regulate the incoming supply. Traditionally servo variac regulators have been commonly applied, but now electronic voltage conditioners are available with much faster performance and better control.

Many food and beverage processes are large loads and can benefit from centralized power protection, even in locations with high quality electrical supply. ABB's comprehensive range available enables customers to choose a product that matches their needs.

Our product offering for food and beverage applications

SPECIFICATIONS	PCS100 AVC-40 for sag correction
UTILITY - INPUT	
Power range	150 – 3600 kVA
Voltage (model specific)	220 V – 480 V, 3-phase
PERFORMANCE	
Efficiency	Typically >98%
Sag correction response	Initial < 250 µs, complete < ½ cycle
Sag correction	
Three phase sags	60% to 100% for 30 s, 50% to 90% for 10s
Single phase	45% to 100% for 30s
Continuous regulation range	±10%

SPECIFICATIONS	PCS120 MV UPS
UTILITY - INPUT	
Power range	2.25 to 22.5MW (up to 10 units in paallel)
Voltage (model specific)	6.6 to 22kV
Demand response	Yes
PERFORMANCE	
Efficiency	Typically >98%
Autonomy (Li-ion batteries)	15 seconds - 15 minutes

SPECIFICATIONS	PCS100 UPS-I
UTILITY - INPUT	
Power range	150 – 3000kVA
Voltage (model specific)	220 V – 480 V, 3-phase
PERFORMANCE	
Efficiency	400 & 480 V models: Typically 99 % 220 V models: Typically 98 %
Transfer time	Typically ≤ 1.8 ms
Autonomy period	2s – ultracapacitors 30s – VRLA batteries

SPECIFICATIONS	PCS100 AVC-20 for voltage regulation
UTILITY - INPUT	
Power range	250-3000kVA
Rated Voltage	380 V - 415 V, 3 phase
PERFORMANCE	
Efficiency	Typically >98%
Voltage varation detection time	250 µs
Voltage regulation time	**<20** µs for any voltage deviation within the specification
Continuous regulation	
Undervoltage	-15% (load power factor 1.0) -20% (load power factor 0.75)
Overvoltage	+20%




SPECIFICATIONS	SG Series	PowerWave 33	DPA 250 S4	PowerLine DPA
UPS frame rated power	10-500 kVA	60 / 80 / 100 / 120 / 160 / 200 / 250 / 300 / 400 / 500 kW	300 kW	20 -120 kVA (3ph); 20 - 80 kVA (1ph)
UPS module rated power	-	-	50 kW	20 - 40 kVA
UPS output rated PF	0.9	1.0	1.0	1.0
Max. no of parallel frames	Up to 6 UPSs	Up to 10 UPSs	Up to 5 UPSs	2 (Redundancy)
Max no of parallel modules across system	-	-	30 modules	6
Max. system power	3000 kVA	5000 kW	1500 kW	120 kVA
Wiring	3ph + N +PE	3ph + N + PE	3ph + N + PE	3ph + N+ PE (3ph); 1ph + N + PE (1ph)
UPS type	**Standalone tower**	**Standalone tower**	**Modular (DPA)**	**Modular (DPA)**
Topology	Online double conversion	Online double conversion	Online double conversion	Online double conversion
INPUT				
Rated output voltage (load dependent)	3x 380/400/415 VAC	220 / 380, 230 / 400, 240 / 415 VAC		400/230 VAC (3ph); 230 VAC (1ph)
Voltage THD (with linear load)	< 1.5%	< 2%		< 2%
Rated frequency	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)		50 or 60 Hz (selectable)
EFFICIENCY				
Line-interactive	-	-	-	-
Double conversion	up to 94.6%	Up to 96%		Up to 96%
Eco-mode	up to 98.7% (eBoost)	99%		98.5%
ENVIRONMENT				
User interface	System Graphical Diyplay LCD	Graphical touch screen (optional on 160 - 200 kW), LCD + mimic diagram (on 60 - 200 kW only)		System graphical display (HMI) + LCD panel UPS Module
Communication ports	RS232, SNMP (Modbus IP, RS232, RS485 & BacNet IP)	USB, RS-232, SNMP slot, potential-free contacts		SNMP; ModBus; potential free contacts
Control / monitoring	Monitoring and shutdown software available as option			

Protecting businesses on a global scale

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.

Dairy
When a regional dairy processing facility needed to ensure availability of their control and safety systems they turned to ABB for help. This resulted in installation of multiple ABB DPA UPScale33 modular UPS systems; this gave the site confidence by ensuring common spares across the site and maximised availability even in a remote location.

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 helped to eliminate voltage sags, cutting out over four power quality events annually, saving an estimated cost of $200,000 per year.

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 the rules and regulations around dairy products this meant re-sterilizing the equipment; taking around four hours each time. The PCS100 UPS-I prevented voltage sags caused by these thunderstorms and eliminated 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.

Full Service

Service is what really makes ABB stand out. At ABB we recognize that designing and manufacturing innovative and high-quality power protection products is only half the story. To deliver the peace of mind and return on investment you expected, your power protection equipment must be correctly specified, installed, commissioned and maintained. This is why we invest heavily in our pre- and post-sales support infrastructure and why we offer a comprehensive range of services for the entire working life of your ABB products.

ABB's global network
ABB is one of the world's leading engineering companies, helping customers to increase industrial productivity and to lower environmental impact in a sustainable way. With strong market positions in its core businesses, ABB Group operates in around 100 countries and employs about 150,000 people.

Key features of your service plan
- Pre-purchase engineering
- Installation and commissioning
- Technical support
- Training
- Preventive and corrective maintenance
- Retrofit and refurbishment
- Globally available, supported by regional service hubs and operating in more than 100 countries
- Spare part availability and stocking
- Onsite repairs
- Any-time, year-round local support line

Installation and commissioning
ABB can install and commission any power protection product on site. Commissioning is carried out by fully-trained Service Engineers and can be packaged with operator/owner training on the product if desired.

Training
Training for operators and maintenance staff is offered at two locations on a regular basis (Napier, New Zealand, and Lodz, Poland). On site training can be delivered by arrangement.

End of life services
ABB also offers full end of life services including options around upgrades and replacements to ensure the plant continues to be protected long after installed equipment has reached end of design life. Software and hardware upgrades are also available as required to extend the life and functionality of power protection systems.

Service agreements
We offer a range of service contracts to suit any application. These contracts cover anything from basic annual onsite checks and access to round-the-clock support, through to fully comprehensive contracts that cover all parts plus site time and emergency response. Service contracts provide improved cost controls, increased operational efficiency, lower capital expenditures and extended product life time.

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