ABB drives and automation products

Food and beverage solutions
Cutting edge reliability
When all your processes require high reliability, take comfort knowing that all ABB drives undergo extensive testing prior to customer delivery. From sub-kilowatt to megawatt ratings in low- and medium-voltages, ABB motors and drives systems for the food and beverage industry are also equipped with coated boards to protect electronics and circuitry from wet or humid environments.

Minimized operational and maintenance costs
Utilizing an ABB drive means applying the correct process speed, saving energy, reducing waste and keeping quality costs under control. For example: the high electrical costs of operating cold storage systems can be reduced by varying the compressor’s motor speed in accordance to the true temperature measured. Increased control= reduced mechanical wear = increased process output.

Drives for harsh conditions
Combustible dust in the flour and grain handling industries means an increased risk of ignition. Special requirements are set for machine surface temperatures, bearings, and critical components. For these special protection areas ABB offers dust ignition proof (DIP) motors that can be used with ABB drives according to ATEX certification. ABB provides an IP66/67 drive that meets the stringent NSF/ANSI standard aimed at special purpose food equipment and devices used in wet and dusty environments.

Meeting Machinery Directive requirements
Safety functions are an essential feature of today’s AC drives and can bring benefits throughout the food and beverage industry. They control human and machine safety, and stop, automatically or manually, the machine process when the machine operator’s safety is an issue.

Freedom to interface with plant control systems
Industrial communication networks, like Profibus, Profinet, Modbus, Ethernet/IP, enables process equipment to integrate with plant control systems, which improve the process control and condition monitoring. ABB has expertise with the most commonly used fieldbus communications interfaces and protocols, meaning ABB drives can connect with most of the industrial fieldbus and plant monitoring systems.

Fast response to increased processing demands
ABB drives’ flexible application macros, together with advanced motor control, ensure accurate and fast response times to process flow demands. For example, the application control macro for pumps commands the drive to start additional pumps in response to pressure drops, should there be a surge in demand. As well as dedicated pump control, the drive provides a pre-pressurization for process start-ups.

Staying competitive in the food and beverage market depends on achieving efficiencies throughout the value chain, with a particular focus on the performance of the production processes. While lowering energy consumption and minimizing maintenance costs have become basic requirements, high process uptime, permanent traceability, uncompromising hygiene, and an unbroken cold chain are just a few of today’s challenges to be achieved.
Mixers
Mixing, the most common process in food and beverage, requires precise control to ensure the best quality end products. High starting torque and different mixing speeds are often needed from start to finish, often within the same batch. Whether mixing in batches or in a continuous stream, mixing solids or liquids, the ability to control the mixer’s speed and torque affects both production speed and process up-time.

Our variable frequency drives provide accurate speed and torque control to adapt to your mixing load. Even complex ingredient blends are manageable with scalable PLCs and a selection of operator panels for increased precision control, reliability, and flexibility. For mixing dough, meat, dairy products or beverages, our automation products integrate with one another, offering an efficient solution for all your mixing needs.

**Drive’s features for mixers**
- Eliminate the process interruptions and reduce the everyday mechanical stress on the mixer by soft start function of a drive
- Improve operational safety within your mixing process with safe torque off (STO) function
- Reduce motor noise of a machine by adaptive switching frequency control
- High starting torque and accurate torque control for mixing applications
- EMC filters and safety features for fulfilling directives, standards and legal requirements
- High protection class for harsh conditions against dust and water

Conveyors
There are a number of different conveyor systems in use throughout food and beverage production. One thing that links them all is the need for speed control at some point in their operational duty. Conveyors may be run continuously, intermittently or at variable speed, with a variable speed conveyor motor and a variable speed drive.

One of the most important benefits in using low voltage AC drives to control the speed of conveyors is the smooth starting and stopping of the conveyor. This results in lower maintenance costs by reducing mechanical stress on the gears and belts. Less maintenance means increased process uptime. AC drives also allow processes and machines to run at exactly the right speed, saving energy and cutting running costs.

By offering more precise control of the production process, variable speed can also result in enhanced quality of the end products.

**Drive’s features for conveyors**
- Built-in brake chopper provides precise control of conveyor deceleration rate(s), without the need of additional external hardware
- Safe torque-off (SIL3) prevents unexpected movement of the conveyor
- Sequence programming provides an easy way to create sequences of operations
- Programmable control connections reduce the need for external PLCs, timers and counters, resulting in less complex motor control systems and reduced costs
- Connectivity with plant control systems
**Pumps**

From irrigation systems to sanitation procedures, pumps are everywhere in the industry. ABB drives feature flexible application macros that, together with advanced motor control, ensure accurate and fast response times to process flow demands. For example, should there be a surge in demand the application control macro for pumps commands the drive to start additional pumps in response to pressure drops. In addition to dedicated pump control, the drive provides a pre-pressurization for process startups.

ABB low voltage drives can be integrated with the process automation and programmable logic controllers fans (PLCs). The drives and PLCs communicate seamlessly, easily integrating the drives with the plant automation.

**Drive’s features for pumps**
- Built-in pump protection functions such as multi-pump control, pipe clean and fill functions
- Soft pipe filling provides a pump with soft-start, enabling a smooth build-up of flow in pipes while increasing the life time of the pipe work and pumping system
- Pump and Fan Control (PFC) for use where several parallel pumps are operated together and the required flow rate is variable

**Fans**

Air circulation and temperature control are key factors in many processes within the food and beverage industry. Chilling, baking, drying, and storing are only a few that rely on precise fan control to maximize productivity and minimize energy consumption, while improving the bottom line.

Many air systems are designed for full-load conditions even though most of the time the loads are average. This results in higher than necessary energy consumption levels and increased overall costs. Additionally, unnecessary mechanical strain is put on the motor and other system equipment as motors stop and start abruptly to maintain conditions.

ABB provides drives that ensure the fan-motor speed is continually optimized to ensure the best combination of consumption, speed and noise.

**Drive’s features for fans**
- Designed with a powerful set of features that vary the drive’s performance in response to changes in pressure, flow or other external data.
- Pump and fan control (PFC) feature modulates the speed of the main fan and brings any auxiliary fans on line as necessary.
Decanters
Separating liquids from solids requires precision, reliability, and absolute safety. Our low voltage drives and PLC’s offer you control over these variables, while our regenerative drives capture and reuse braking energy in any decanter application, from fruit and vegetables, dairy, sugar to the edible oil industries.

ABB low voltages drives will help manage application-specific operation sequences/patterns including prewashing, filling, washing, spinning, unloading, and final standstill.

Drive’s features for decanters
- Drives with direct torque control (DTC) give you extremely accurate decanter torque control, from high starting torque across the whole speed range
- Capture and reuse braking energy with our regenerative drives for improved energy savings
- Safe torque off and safety options give you flexibility to improve your machine safety
- Flexible PLC range and HMIs scale to your control needs
- Application-specific control program is designed to perform practical programmable sequences for conventional centrifuges and 2-phase decanters
- Continuous load compensation function provides precise speed control which has a direct impact on the process speed and quality of the end product
- Flexible enclosure options for panel mount or wall mount installations

Separators
Meticulous control and precision is necessary for separating solids from liquids. Rotation speeds needs to be accurate for high end product quality and production speed. Our variable speed drives featuring direct torque control (DTC), scalable PLCs, and selection of HMIs help overcome all these challenges.

Separators also need to be reliable for consistent food quality. Achieving continuous peak performance depends on accurate speed and torque control, even if the rotational speed changes with the weight of raw materials. Operating above nominal speed during the cleaning process is also a consideration.

Drive’s features for separators
- Drives with direct torque control (DTC). Separators have a high starting torque and DTC enables extremely accurate torque control over the whole speed range
- Variable speed regulation according to varying air volume and particle size
- Short term overloading during cleaning sequence
- Safe torque off and other safety options to help you meet your machine safety requirements
- Resistor braking and regenerative braking, where braking energy is fed back into the mains, thus lowering the consumption of energy.
- Flying start functionality means the separator can be started when spinning saving you time and reduce wear on your equipment
- Flexible PLC and HMIs that scale to your control needs
Pick, Pack and Fill
Getting new foods into production quickly and efficiently is imperative. This means flexible automation solutions that can handle unforeseen needs and unusual shapes and sizes, with easy to use controls and minimal engineering requirements.

ABB has a variety of solutions that can improve the precision, agility, and speed of the most demanding picking and packaging processes. Our automation offering includes a wide range of variable speed drives, servo drives, scalable PLCs, and a selection of HMIs to meet your control needs. With functional safety options, from built-in safe torque off to safety PLCs, you can easily implement your safety requirements.

Features for pick, pack and fill
- Higher quality of final products through more precise control of machinery
- Increased level of automation leading to better control of the entire process
- Minimized energy consumption
- Installed applications from (1) to (16) axes
- Downloadable Automation Builder software with sample applications to assist in development
- Integrates easily with all major fieldbus protocols for simple communications between machines

Material Handling and Labeling
There are many types of labeling systems, ranging from single label low precision/low speed ‘trigger and fire’ types to much larger multi-head contact transfer systems that increase production throughput by applying different labels simultaneously to more than one area of a container—for example, labels used for both sides as well as the neck of glass bottles.

ABB’s motion controllers, servo drives, programmable logic controllers (PLC), and other industrial automation products are designed to meet the demands of this application through straightforward product features and programming software.

Features for material handling labeling systems
- Dual encoder support allows connection of the main conveyor encoder to match speed and position of product
- Scalable and modular architecture allows the solution to be tailored to the application
- Specific motion keyword for example “trigger on position” and “trigger compensation” developed to increase label machine speed
- Configuration wizards that simplify set-up
- Easy to program multitasking software, downloadable with sample code for fast development, including Pack ML
- One controller for all your labeling requirements
- PLC based solutions are increasingly popular in the packaging industry; the ABB AC500 PLC open motion functionality is one of the most capable of all PLC vendors.
ABB in food and beverage
Additional products

Motors
ABB and Baldor offer a full line of performance-proven, energy-efficient motors for the entire scope of the food and beverage industry. Our motors help run food and beverage applications without compromising on the demanding industry standards, from raw material handling, to processing and conveying, to packing and storage.

Power Transmission Products
Baldor® Ultra Kleen and E-Z Kleen Quantis and Tigear-2 gear reducers and ball bearings are designed specifically for the food and beverage industry, and meet FDA standards for incidental food contact. These products offer an array of features that provide extended life in these challenging conditions. These gear reducers and mounted bearings feature an industry-leading seal design that prolongs your equipment life, thus reducing total cost of ownership.

Instrumentation
ABB supplies a comprehensive range of measurement and control products and systems for use throughout food and beverage processes. Utilizing the latest communications technology, these products can help customers to ensure efficient, reliable and economical performance, from the plant floor to the control room to the boardroom.

Low voltage products
ABB's extensive portfolio of low voltage products and systems can help optimize electrical performance throughout the food and beverage chain. All of these products have been certified to the leading international standards, enabling customers to count on safe, reliable and efficient operation.

Robot-based picking, packing and palletizing
Offering fast and flexible performance, ABB's robots for picking, packing and palletizing applications are ideal for meeting the fast changing needs of food and beverage companies. Whether it's responding to a sudden increase in orders or handling a product with completely redesigned packaging, ABB's robot products and systems can quickly rise to any challenge.

Jokab Safety Products
ABB JOKAB SAFETY is working to help Food and Beverage plants to meet demanding production and delivery schedules by offering machine safety systems that improve manufacturing processes with added sustainability, food quality and personnel safety. We are committed to helping you to meet the unique challenges of your industry with electrical machine safety solutions, services and systems that deliver value.
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