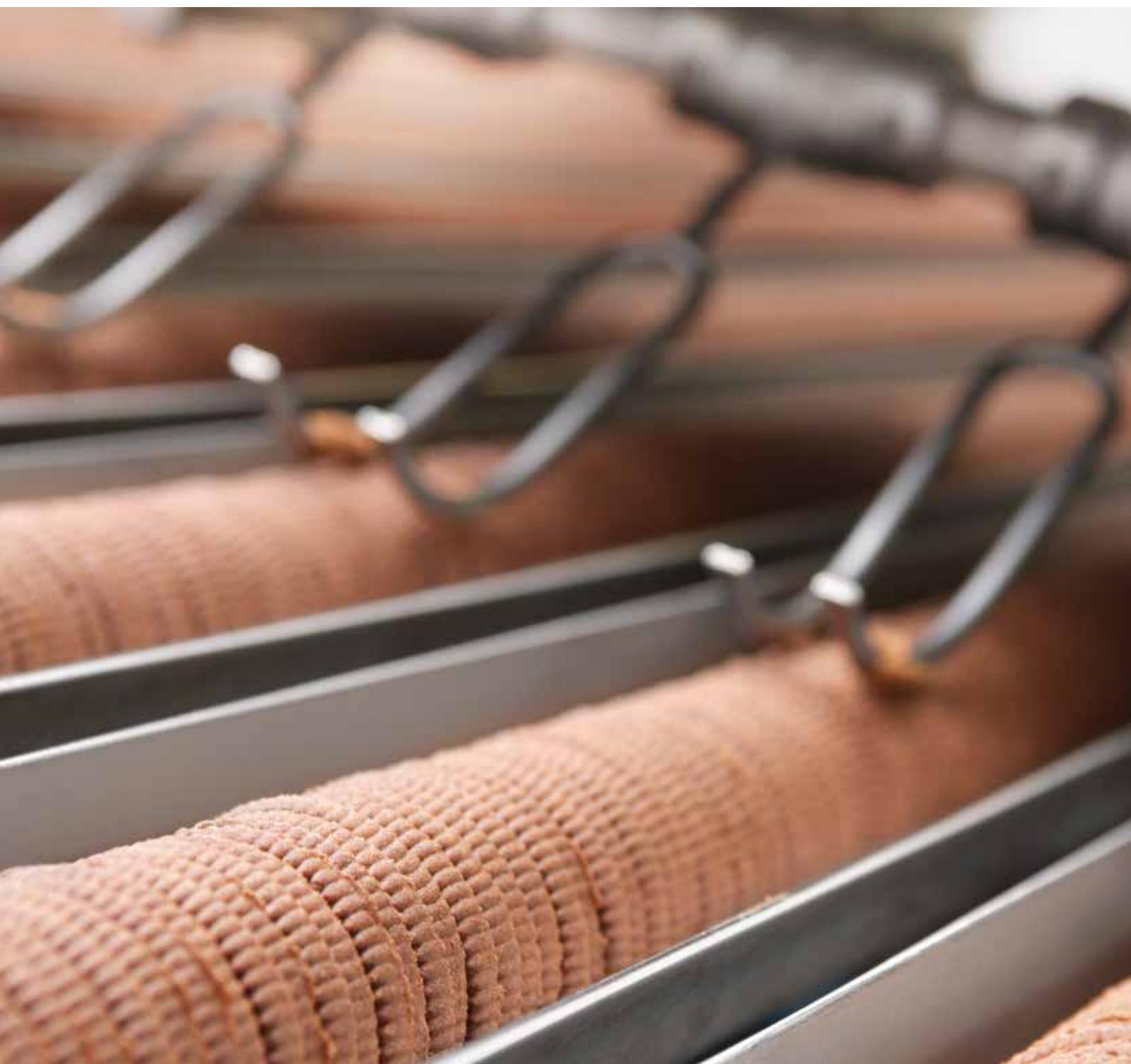


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FOOD AND BEVERAGE

# Drives and automation for food and beverage industry

Safety, Quality and Energy Efficiency



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**ABB helps you build flexible, safe, cost-effective and sustainable production systems that promise top quality and reduced downtime. ABB solutions are designed to help manage your risks and gain the most from today's technology.**

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# Table of contents

004	One-stop solution
005	F&B processes, from raw material handling to palletizing
006	Drives and automation for food and beverage industry
007	Pump control for CIP (Clean In Place)
008	Fan control for blower/evaporators
009	Speed control solution for all conveyor systems
010	Compression at maximum efficiency for refrigeration
011	Variable speed drives with precision control for mixer
012	Precision control solution for separator
013	A range of automation solutions for decanter
014	Pick, pack & fill solution for all types of shapes and sizes
015	Material handling & labelling system solution
016	Cooling tower drive
017	Drive-based functional safety
018	Service to match your needs
019	Drives Service
021	Save time, ease troubleshooting and improve drive performance with ABB smartphone apps
022	ABB automation products

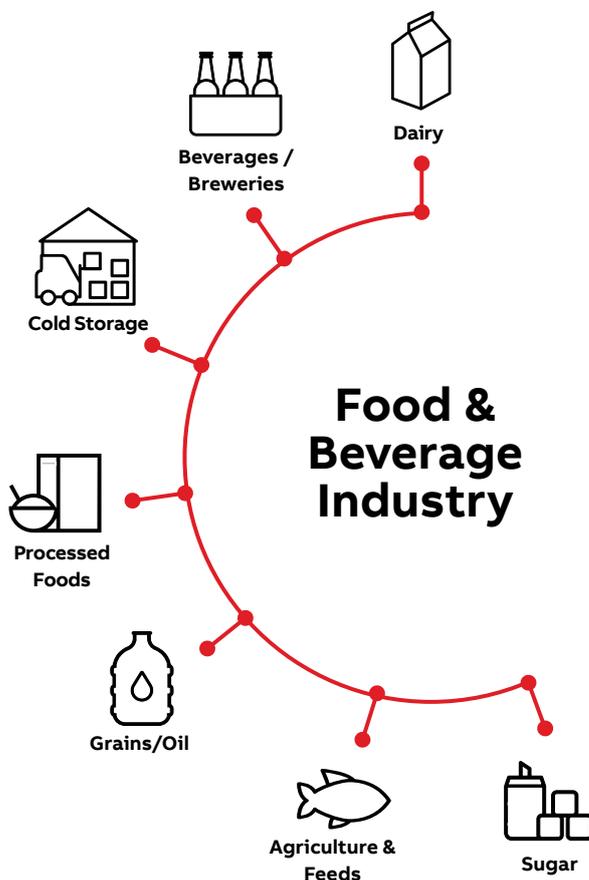
# One-stop solution

In India, growing urbanisation, changing demographics and a steady growth in retail, have propelled the Food and Beverages industry. Alongside this increasing demand, there is also a growing emphasis on food safety, hygiene norms and processing methodologies.

Food and beverage makers need to manage several complexities in parallel with uncompromising efficiency, traceability, hygiene and safety. Continuous and reliable operations in extreme temperatures and corrosive environments with short product life cycles are just a few of the multiple challenges.

ABB drives are designed for the highest process uptime, uncompromising hygiene, maintenance of unbroken cold chains, worker and machine safety, and improved energy efficiency and water optimization.

ABB solutions can help improve quality and productivity, while staying ahead of the ever-increasing expectations of customers with competitiveness and agility.



## Key industries served

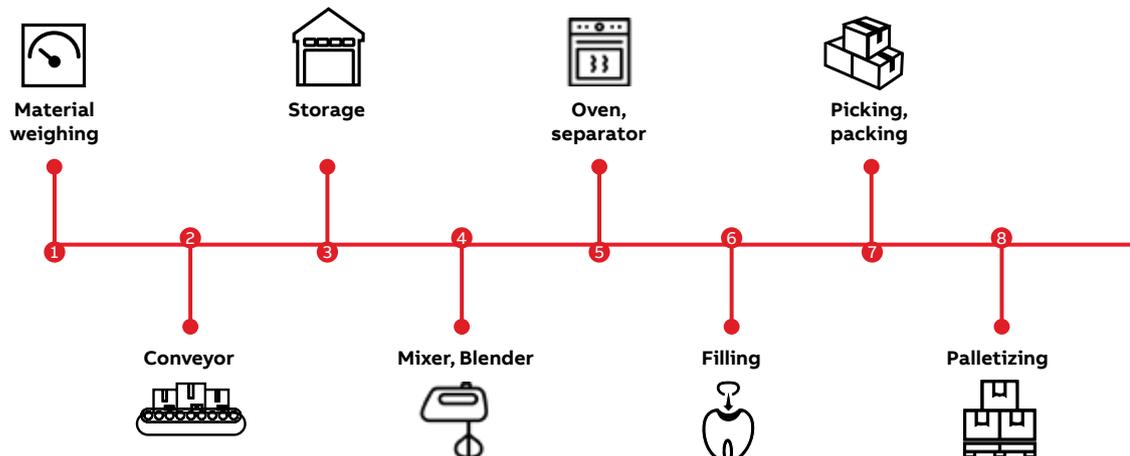
ABB Drives can run a variety of food and beverage applications, from raw material handling, to processing and conveying, to packing and storage, without compromising on the standards you demand.

## Product offerings

- Drives
- PLC
- HMI
- SCADA
- Motion
- Robotics

# F&B processes, from raw material handling to palletizing

ABB's range of drives are designed to help run food and beverage applications end-to-end, right from raw material handling, to processing and conveying, to packing and storage, while ensuring the best quality throughout.



# Drives and automation for food and beverage industry

Drives are an important tool to deliver safety for food and beverage machinery. ABB's Variable Speed Drives (VSD) have been used extensively for controlling the machinery used throughout the food and beverage sector.

—  
01 Micro and machinery drives

—  
02 A, B General purpose drives

—  
03 Industrial drives

ABB drives help achieve precise process control and significantly improved energy efficiency. They also reduce system complexity and ensure compliance on required safety standards. Our drives can play an equally important role in ensuring safe stopping of machinery. ABB VSDs are also used to ensure optimum speed and torque while maintaining the required accuracy.

## ABB drives for food and beverage industry:



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01



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02 A



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02 B



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03

# Pump control for CIP (Clean In Place)

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.

In case of a surge in demand, the application control macro for pumps commands the drive to start additional pumps in response to pressure drops.

ABB drives with IP66 protection are designed for applications exposed to dust, moisture and cleaning chemicals and have several applications in food and beverage industry, particularly dairy. They are made of materials that prevent them from trapping bacteria and help withstand frequent washing.

The drive provides a pre-pressurization for process start-ups. ABB low voltage drives can be integrated with the process automation and

programmable logic controllers (PLCs). The drives and PLCs communicate seamlessly, easily integrating the drives with the plant automation.

- Built-in pump protection functions such as multi-pump control, pipe clean and fill functions
- Soft pipe filling for soft-start of the pump, 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
- Dedicated IP66 drives for CIP applications and others



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# Fan control for blower/evaporators

Processes such as chilling, baking, drying, husk separation and storing rely heavily on air circulation and temperature control. They require precise fan control to maximize productivity and minimize energy consumption, while improving the bottom line.

Air systems designed for full-load conditions result in higher than necessary energy consumption levels, increased overall costs, and unnecessary mechanical strain on the motor, even with average loads. 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:

- 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.



# Speed control solution for all conveyor systems

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 conveyor 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.

# Compression at maximum efficiency for refrigeration

On most industrial sites whether Fruit and Vegetable cold storage / Meat & Seafood storage / Dairy Chillers / food parks or cold chain solutions, the demand for compressed air or cold production varies according to the time, the day or the season.

If a compressor is not able to adjust compression by varying the speed of the motor, the energy bill is unnecessarily high. Variable speed technology can change this. Our drives help you save energy during consumption under partial loads. The drives will vary the speed of the compressor motor to correspond to the actual demand.

They also react quickly to changes in demand, so you do not have to keep higher discharge pressures in reserve to compensate. We offer a wide selection of PLCs, operator panels and low voltage products, such as circuit breakers, that can be easily integrated with all of the ABB components. By

working closely together with OEMs, ABB has developed an automation product offering that enables precise, dependable and energy-efficient compressor operation.

In an ammonium compressor cooling system, liquid loops are responsible for regulating the temperature. To accomplish this, a number of applications must work together: compressor, condenser, evaporator, chiller and pumps. All of these must operate motors as efficiently and simply as possible. ABB drive can help in getting better efficiency for various sections. ABB drives offer, optional pressure Vs temperature table for various refrigerants & part load mechanism configuration

## Compressor

ABB drives are suitable to run all kinds of compressor and Motor types used for compressing ammonium. Even high speed motors are supported. By using the drive's internal programmability, interlocking between different functions can be built according to process needs.



# Variable speed drives with precision control for mixer

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 the 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

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# Precision control solution for separator

Meticulous control and precision are necessary for separating solids from liquids. High end product quality and production speed require accurate rotation speeds.

Our variable speed drives 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:**

- Separators have a high starting torque and drives with direct torque control DTC enable 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 while spinning, thus saving you time and reducing wear and tear on your equipment. Flexible PLC and HMIs that scale to your control needs.



# A range of automation solutions for decanter

Whether you are producing juice, wine, beer or edible oil, our extensive portfolio of drives, motors and automation products are the perfect solution for your decanter leading to precise speed difference and balanced power control.

ABB regenerative drives capture and reuse braking energy in any decanter application, from fruit and vegetables, dairy, sugar to the edible oil industries

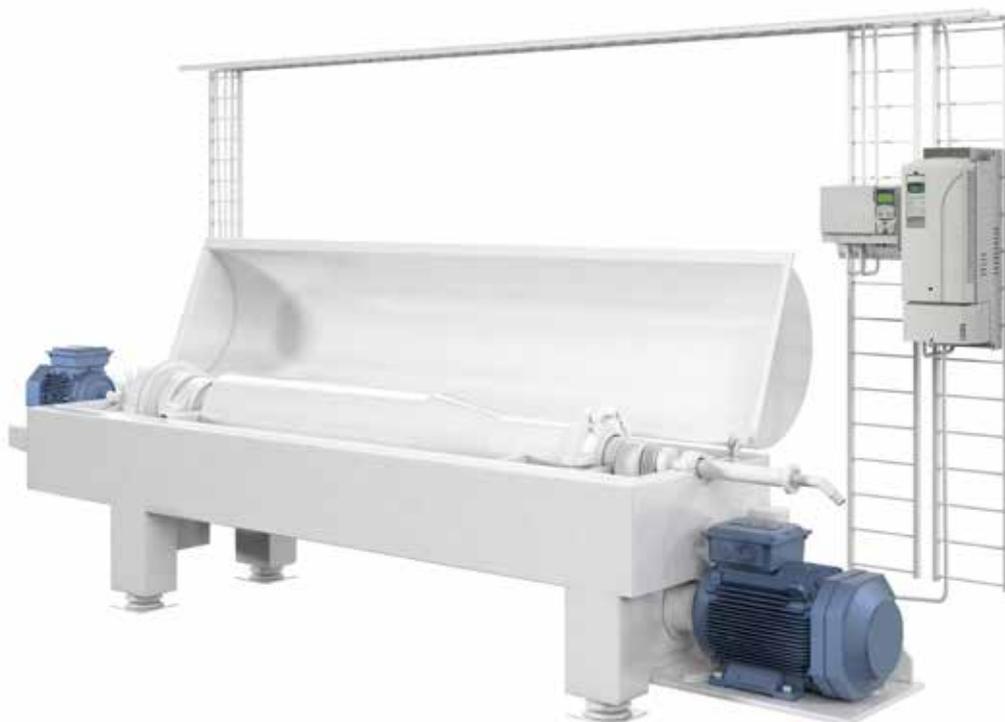
ABB low voltages drives will help manage application-specific operation sequences/ patterns including prewashing, filling, washing, spinning, unloading, and final standstill.

#### Drive's features for decanters

- Direct torque control (DTC) drives 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



# Pick, pack & fill solution for all types of shapes and sizes

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

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# Material handling & labelling system solution

There are many types of labelling 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 labelling 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 labelling 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.



# Cooling tower drive

Cooling towers are used in food processing plants all over the world. Maintenance and failure of the gearbox, and associated components, is often problematic with traditional systems. The Baldor Reliance® RPM AC direct drive cooling tower eliminates these problems by coupling the motor directly to the fan and controlling it with a unique drive.

## **Baldor-Reliance RPM AC cooling tower motor**

The RPM AC cooling tower is a high torque direct drive motor for cooling tower applications with all the benefits of variable speed control, while eliminating the cost and maintenance required for traditional gearbox or belted solutions. The fan couples directly to the motor and is controlled by a unique AC drive to provide optimal speed and performance that runs quieter with reduced energy consumption.

## **Benefits of direct drive motor:**

- Eliminates the need for a gearbox, and associated components, reducing maintenance time and cost
- Reduces energy consumption
- Longer life as motors have up to 5x the life-expectancy of gearboxes
- Eliminates the alignment of mechanical components for quicker installation, reduced installation costs and increased system efficiency.



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## Drive-based functional safety

Safety is an important aspect of industrial applications involving motors, drives and programmable logic controllers (PLCs). By identifying and reducing risks to an acceptable level, we can ensure greater machine safety. An inherently safe design coupled with the application of risk-reducing protection measures, such as safety functions, can help minimise risk.

ABB has a wide range of safety devices and solutions that are easy to integrate in industrial applications for improved safety, uptime and functionality. ABB drives offer functional safety solutions together with a wide range of safety devices for smart machine design.

Our LV AC drives have safe torque off (STO) built-in as a standard or offers it as an optional safety function. STO in our drives together with additional safety functions enhance application safety. ABB's functional safety design tool helps safety designers achieve the required safety solution for their machines. Our drive-based functional safety offering complies with the requirements of international standards and requirements.



# Services to match your needs

Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers' four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance? Is uptime your priority? Keep your drives running with precisely planned and executed maintenance.

Operational efficiency



Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

**Example services include:**

- Life Cycle Assessment
- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- Reconditioning
- ABB Drive Care agreement
- Drive Exchange

Rapid response



Is rapid response a key consideration?

If your drives require immediate action, our global network is at your service.

**Example services include:**

- Technical Support
- On-site Repair
- Remote Support
- Response time agreements
- Training

# Drives service

## Your choice, your future

### The future of your drives depends on the service you choose.

Whatever you choose, it should be a well-informed decision. No guesswork. We have the expertise and experience to help you find and implement the right service for your drive equipment. You can start by asking yourself these two critical questions:

- Why should my drive be serviced?
- What would my optimal service options be?

From here, you have our guidance and full support along the course you take, throughout the entire lifetime of your drives.

### Your choice, your business efficiency

ABB Drive Care agreement lets you focus on your core business. A selection of predefined service options matching your needs provides optimal, more reliable performance, extended drive lifetime and improved cost control. So you can reduce the risk of unplanned downtime and find it easier to budget for maintenance.

### We can help you more by knowing where you are!

Register your drive at [www.abb.com/drivereg](http://www.abb.com/drivereg) for extended warranty options and other benefits.

## Life cycle management



Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

#### Example services include:

- Life Cycle Assessment
- Upgrades, Retrofits and Modernization
- Replacement, Disposal and Recycling

## Performance improvement



Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

#### Example services include:

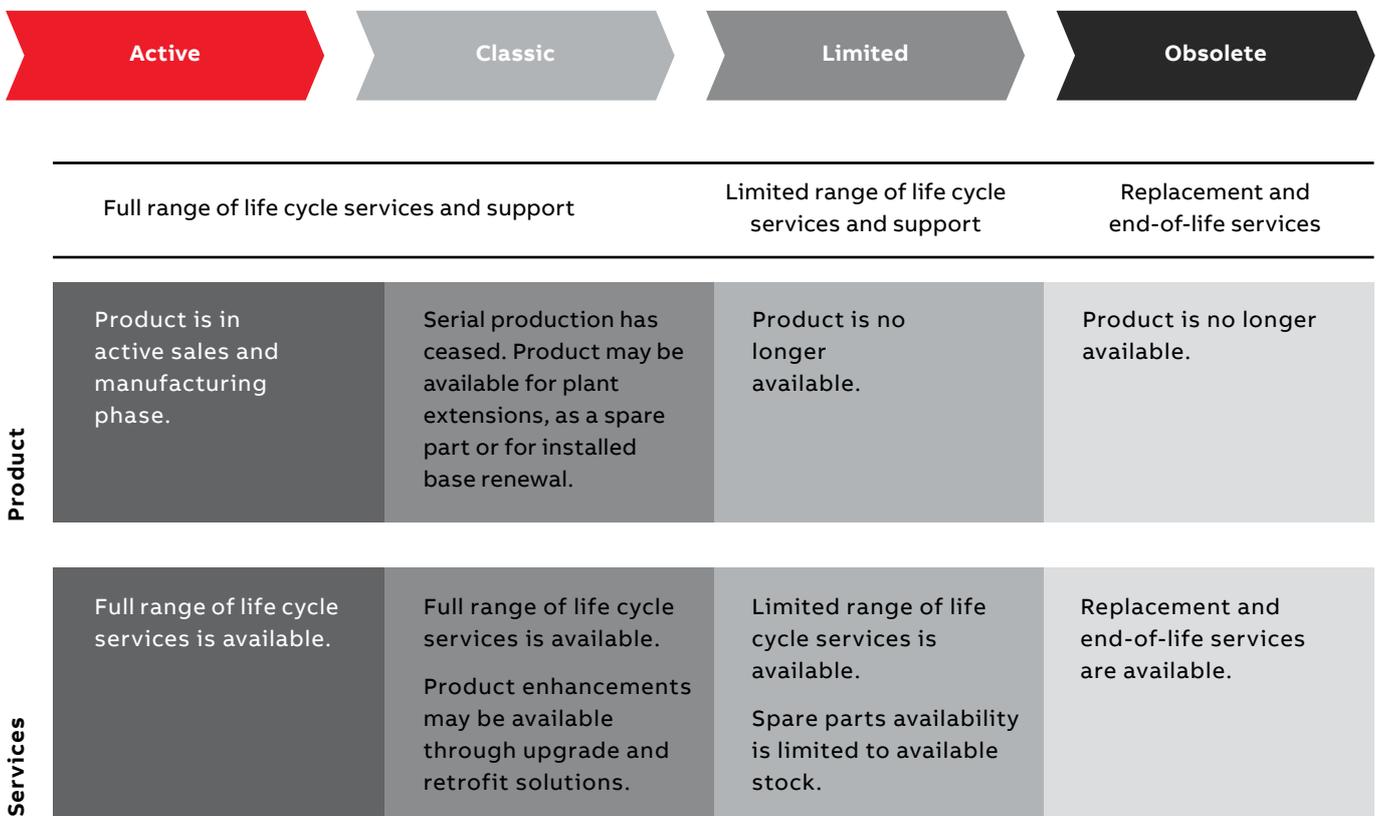
- Advanced services
- Engineering and Consulting
- Inspection and Diagnostics
- Upgrades, Retrofits and Modernization
- Workshop Repair
- Tailored services

# A lifetime of peak performance

Now it's easy for you to see the exact service and maintenance available for your drives.

You're in control of every life cycle phase of your drives. At the heart of drive services is a fourphase product life cycle management model. This model defines the services recommended and available throughout drives lifespan.

**ABB drives life cycle phases explained:**



**Keeping you informed**

We notify you every step of the way using life cycle status statements and announcements.

Your benefit is clear information about your drives' status and precise services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.

**Step 1**

**Life Cycle Status Announcement**

Provides early information about the upcoming life cycle phase change and how it affects the availability of services.

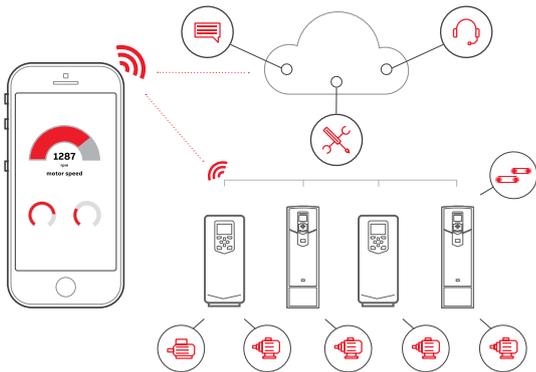
**Step 2**

**Life Cycle Status Statement**

Provides information about the drive's current life cycle status, availability of product and services, life cycle plan and recommended actions.

# Save time, ease troubleshooting and improve drive performance with ABB smartphone apps

## Better connectivity and user experience with Drivetune



Easy and fast access to product information and support

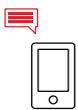
## Manage your drives and the process lines and machines they control



Easy access to cloud-based drive and process information from anywhere via an online connection



Start up, commission and tune your drive and application

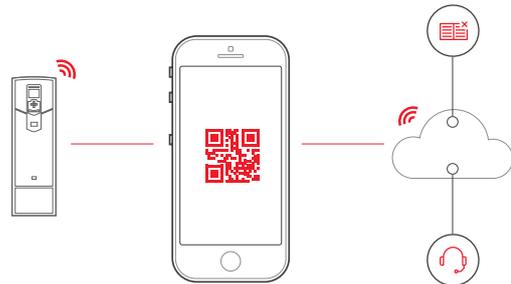


Simplified user guidance with instant access to drive status and configuration



Performance optimization via drive troubleshooting features and fast support

## Services and support on the go with Drivebase



Search for support documents and contacts

## Maintain and service all your installed drives on one or multiple sites



Get 6 months extra warranty for free by registering your drive with the Drivebase app



Access your product and service information in the cloud from anywhere



Access your drive's diagnostics data



Push notifications for critical product and service updates

## Access information anywhere

Download the apps using the QR codes below or directly from the app stores



**Drivetune** for commissioning and managing drives

**Drivebase** for ensured reliability and reduced downtime on production sites

# ABB automation products



## AC500

ABB's powerful flagship PLC offering provides wide range of performance levels and scalability within a single simple concept where most competitors require multiple product ranges to deliver similar functionality.



## AC500-XC

"Extreme conditions" modules with extended operating temperature, immunity to vibration and hazardous gases, for use at high altitudes, in humid conditions, etc. It replaces expensive cabinets with its built-in protection.



## AC500-S

A PLC based modular automation solution that makes it easier than before to mix and match standard and safety I/O modules to expertly meet your safety requirements in all functional safety applications. "Extreme conditions" version is also offered.



## Control panels

Our control panels offer a wide range of touchscreen graphical displays from 3.5" up to 15". They are provided with user-friendly configuration software that enables tailor made customized HMI solutions. Rich sets of graphical symbols and the relevant drivers for ABB automation products are provided. Control panels for visualization of AC500 web server applications are available.



## Programmability

Automation Builder integrates the engineering and maintenance for PLC, drives, motion, HMI and robotics. It complies with the IEC 61131-3 standard offering all five IEC programming languages for PLC and drive configuration. Automation Builder supports a number of languages and comes with new libraries, FTP functions, SMTP, SNTP, smart diagnostics and debugging capabilities.



## All-compatible drives portfolio

The all-compatible drives share the same architecture; software platform, tools, user interfaces and options. Yet, there is an optimal drive from the smallest water pump to the biggest cement kiln, and everything in the between. When you have learned to use one drive it is easy use the other drives in the portfolio.



## AC motors

ABB's low voltage AC motors are designed to save energy, reduce operating costs and enable demanding motor applications to perform reliably and without unscheduled downtime. General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise. Process performance motors provide the most comprehensive, versatile set of motors for the process industries and heavy-duty applications.



## Jokab safety products

ABB Jokab Safety offers an extensive range of innovative products and solutions for machine safety systems. It is represented in standardization organizations for machine safety and works daily with the practical application of safety requirements in combination with production requirements.



## AC500-eCo

Meets the cost-effective demands of the small PLC market while offering total inter-operability with the core AC500 range. Web server, FTP server and Modbus-TCP for all Ethernet versions. A Pulse Train output module is available for multi-axis positioning.



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**ABB India Limited**

Plot No. 4A, 5 & 6, 2<sup>nd</sup> Phase  
Peenya Industrial Area  
Bengaluru – 560 058, India

[abb.com/drives](http://abb.com/drives)

