



MOTION

Meat, poultry and seafood production

Improving safety, efficiency
and sustainability

Tackling safety, efficiency and sustainability

More than ever, consumers and retailers are driving the innovation in meat, poultry and seafood production. Yet the demands for convenient and healthier foods, smaller portions and natural ingredients, packed in multiple ways, is placing critical importance on safety, efficiency and sustainability. Variable speed drives (VSDs)/ variable frequency drives (VFDs), motors and PLCs now play an even greater role in adjusting production to meet these challenges.



Food and personnel safety



“I need to make my plant and personnel safety a priority.”

Tackle diverse safety demands...

- Employees must not be exposed to hazards, from process equipment such as mixers, grinders and cutting machines like band saws and bowl cutters, to risks associated with heat treatment, conveyors and packing machinery.

...using best-in-class technology

- Remote monitoring protects personnel from potentially dangerous machinery.
- Advanced functions, like safe torque off, make sure equipment such as grinders and cutters come to a safe and efficient stop.

Conform to the latest safety standards...

- Changing legislation, aimed at improving hygiene and food safety, means producers need to adapt or update equipment to remain compliant.
- Processes demand machines with improved cleaning systems.
- 360 degree accessibility for cleaning and inspection of machinery.

... with solutions that build trust

- Complying with high ingress protection (IP) standards can prevent product/motor failures in hygienic areas which are due to harsh washdowns/chemicals used.
- Smooth design with no crevices ensures all areas can be cleaned thoroughly to prevent bacterial growth and contamination of fresh meat.



Energy efficiency



“We need to cut our energy bill and carbon footprint.”

Find the big energy consumers...

- Using ABB Ability™ Smart Sensors for either low voltage motors and/or general machinery helps to spot energy saving opportunities among the motors running refrigeration pumps through to blast chiller fans.
- Focusing on pumping and cooling can optimize energy consumption and lower costs by up to 60 percent.

... then unlock the saving potential

- Upgrading to high efficiency VSD/VFD-motor package lowers energy between 20 to 60 percent and reduces carbon dioxide emissions.
- IE4 and higher efficiency class motors are among the most efficient available, contributing to further energy reduction.
- Synchronous reluctance motors (SynRMs) reduce total losses by up to 40 percent, bringing optimal efficiency and reliability.
- By controlling pumps with VSDs/VFDs instead of throttling valves, energy is saved and maintenance is reduced.
- ABB Ability™ Operations Data Management zenon software helps detect ways to optimize energy and resource consumption. Offers excellent reporting functions that give full production transparency.



Productivity improvement



“Our production must adapt quickly to meet evolving customer tastes.”

Keep production agile and accurate...

- Meat producers need to cut waste, especially in high value meat products.
- Flexible machinery is needed that can adapt rapidly to changing consumer demand.
- High starting torque and different mixing speeds are often needed from start to finish, often within the same batch.

... with reliable motor-driven solutions from one supplier

- VSD/VFD-motor packages can increase productivity, for example in slicing machinery for processed meats, often without any extra investment.
- Accurate rotation speeds contribute towards high end-product quality in processes such as mixers and grinders, while saving energy.
- Correct speed control eliminates process interruptions.
- Mechanical stress on conveyors is reduced by a variable speed drive's soft start function.

“We need better intelligence on how production lines are performing.”

Locate the right information...

- Manually extracting plant data is time-consuming and inaccurate.
- Getting access to the right data and turning it into useful information can be difficult.

... through digital solutions

- Multiple inputs and outputs (I/Os) allow a variety of process information from the VSD/VFD to the motor-driven application.
- Open fieldbus systems allow easy VSD/VFD integration to any PLC or similar plant control systems, giving greater insight, information and better production control, thereby avoiding product recalls.



Operation and maintenance



“How can I control rising costs?”

Lower operational overheads...

- Operational costs must be controlled without comprising safety of plant, personnel or end product.

... through advanced maintenance regimes

- Soft starting avoids sudden shock loading, leading to less wear and tear on gears, belts and driven machines.
- ABB Ability™ Condition Monitoring services deliver accurate, real-time information about VSD/VFD and motor events to ensure equipment is available, reliable and maintainable.
- ABB's global service network and preventive maintenance contracts relieve pressure on in-house teams and increase speed of response to critical issues.
- With VSD/VFD pump control software, cleaning time is shorter. Less water and fewer cleaning materials are needed.

“We need the most reliable products and systems to avoid unplanned shutdowns.”

Eliminate production risks...

- Plant shutdowns are costly, from lost production time, spoiled meat products and reputation damage.

... by utilizing smart and reliable functionality

- Temperature, load, under/overvoltage protection and warning features help anticipate breakdowns.
- ABB Ability™ Smart Sensor's condition monitoring functionality warns of upcoming failures, long before they happen, reducing unplanned downtime.
- A drive's real-time clock allows timed tracing of faults, so you know what happened and when.
- Stainless steel motors last five times longer than standard motors in washdown environments.
- Soft starters increase reliability in constant speed applications.

Fine-tuning the supply chain process

The sector's processing techniques are as diverse as the variety of meat, poultry and seafood products available. Several discrete processing steps are common across the industry with each addressing the importance of food safety, traceability, water use and sustainable packaging.

1 DEBONING, SKINNING AND TRIMMING (FOR POULTRY PRODUCTION)

Slaughter is a continuous process that is now fully automated. Deboning is semi-continuous with 75 percent manual activity.

Applications:

- Defeathering
- Spiral conveyors
- Pumps

Requirements

- Precise temperature control
- Accurate tracking of electricity, gas and water use

2 CUTTING, FILLETING, DICING AND SLICING

A semi continuous process. Generates large quantities of solid waste and wastewater.

Applications:

- Overhead conveyors
- Cutters
- Pumps

Requirements

- Meat products strive for better color, appearance, taste, texture, quality and higher yields
- Waste minimization

3 BLENDING AND GRINDING

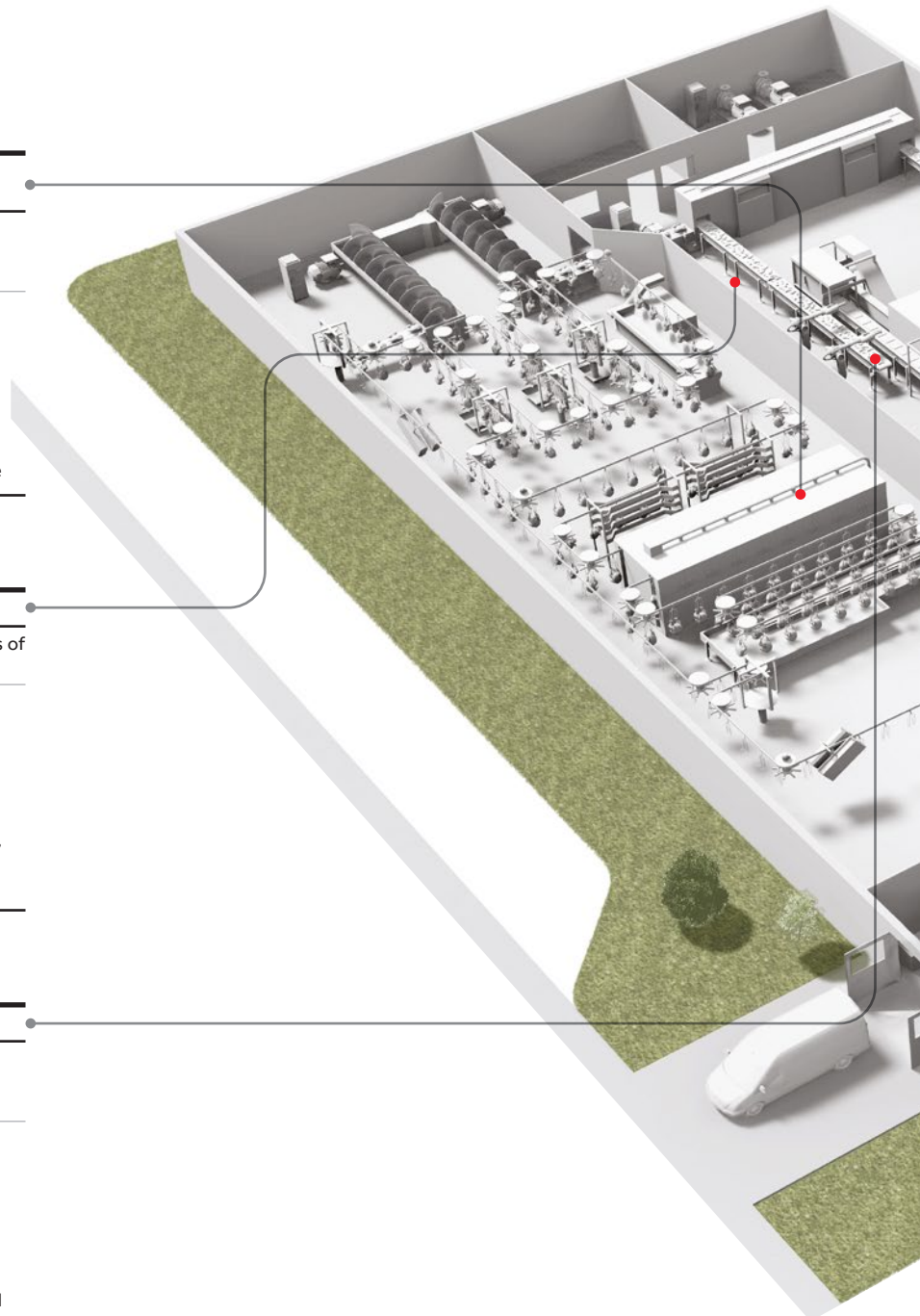
Larger pieces of soft, edible animal tissues can be reduced in size by passing them through meat grinders.

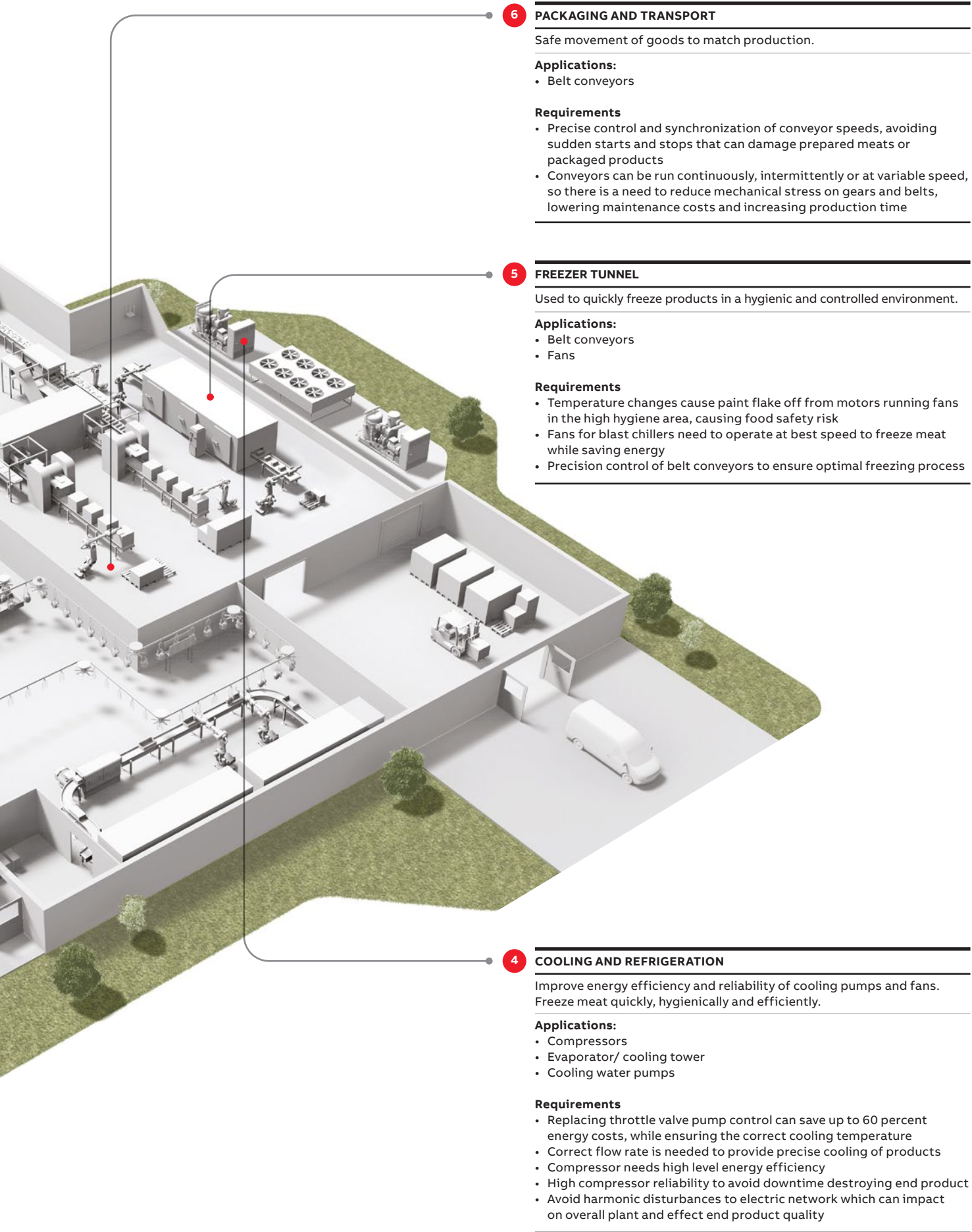
Applications:

- Overhead conveyors
- Grinders
- Mixers
- Pumps

Requirements







- Grinders need to cut frozen meat or separate hard from soft tissues
- High intensity cleaning consumes vast amount of water requiring efficient pumping and hygiene-compliant motors and drives
- Programmable drives with accurate speed and torque control optimize the batch control or continuous mixer control





Unlock the potential in meat, poultry and seafood production applications

Alongside energy saving, improved productivity and greater safety, there are many other benefits from using variable speed drives (VSDs)/variable frequency drives (VFDs) and food safe motor technology on motor-driven applications.

	Challenges	Solutions	Benefits
 Pumps	<ul style="list-style-type: none"> Minimize water use during process equipment and pipe line cleaning 	<ul style="list-style-type: none"> Drives: Clean-In-Place (CIP) with easy-to-use pump control software gives correct pressure and flow rate to pipe clean and fill functions 	<ul style="list-style-type: none"> Cleaning time is shorter Use less water and cleaning materials
	<ul style="list-style-type: none"> High energy user 	<ul style="list-style-type: none"> Motor and drive package: With half the speed only 1/8 of power is needed 	<ul style="list-style-type: none"> Typically, up to 40 percent energy savings compared to throttled control system
	<ul style="list-style-type: none"> Often located in hygienic areas Shrouded pump motors are difficult to clean and do not fulfill hygiene requirements 	<ul style="list-style-type: none"> Stainless steel motors: IP69 protection Paint free-motors: for less demanding environments 	<ul style="list-style-type: none"> Easy to comply with hygiene requirements in the most reliable way. You save money and time on cleaning.
	<ul style="list-style-type: none"> Circulate right amount of cooling water in pipe lines essential for correct speed 	<ul style="list-style-type: none"> Motor and drive package: Vary water flow rates 	<ul style="list-style-type: none"> Avoiding traditional throttling valves saves energy as right pump speed achieved
 Cutters	<ul style="list-style-type: none"> Extreme cleaning and washing can lead to regular component failure 	<ul style="list-style-type: none"> Stainless steel motors: Wash-down duty motors with hygienic design Motors: Protect against extreme wash down conditions up to IP69 	<ul style="list-style-type: none"> Motors can last 5 times longer than standard motors leading to lower total cost of ownership
 Compressors	<ul style="list-style-type: none"> Provide cold air for required temperature, precisely and energy efficiently 	<ul style="list-style-type: none"> High efficiency motor-drive package (SynRM): Provides energy savings to IE5 standard 	<ul style="list-style-type: none"> Typically, up to 40 percent energy savings across speed range
	<ul style="list-style-type: none"> Ensuring ultimate reliability of compressor operation 	<ul style="list-style-type: none"> Softstarters: Suitable for motors running at full speed Drives: Extend speed range of compressor 	<ul style="list-style-type: none"> Avoids wear and tear to mechanical parts, ensuring uptime
	<ul style="list-style-type: none"> Harmonics cause interruptions, interference and downtime 	<ul style="list-style-type: none"> Ultra-low harmonic drives: Harmonic mitigation built-in 	<ul style="list-style-type: none"> Harmonic content is reduced by up to 97 percent Genuine unity power factor with no compensation needed
 Conveyors (inc. overhead, belt, chain, turn & transfer table, roller/turntables, screw)	<ul style="list-style-type: none"> Precise, smooth and consistent control and synchronization of conveyor speeds 	<ul style="list-style-type: none"> Drives: Built-in brake chopper provides precise control of conveyor deceleration rate(s), without external hardware Safe torque off (SIL3) prevents unexpected movement of conveyor 	<ul style="list-style-type: none"> Each conveyor speed adjusted separately and synchronized to ensure material flow between process stages Goods arrive in time and undamaged
	<ul style="list-style-type: none"> Ultimate reliability and safety so production never stops 	<ul style="list-style-type: none"> Motor-drive package: Continuous, intermittent or variable speed operation 	<ul style="list-style-type: none"> Less maintenance increases process uptime Lower maintenance costs by reducing mechanical stress on gears and belts
	<ul style="list-style-type: none"> Food safety and hygiene requirements demand harsh washdown protection 	<ul style="list-style-type: none"> Food Safe motors 	<ul style="list-style-type: none"> Meet hygiene requirements without compromising on reliability and productivity
 Mixers/Grinders	<ul style="list-style-type: none"> High starting torque, wide mixing speed range and precise control within same batch is often needed to ensure best quality from raw material 	<ul style="list-style-type: none"> Drives: Direct torque control provides accurate speed and torque control and adapts to batch or continuous mixer control 	<ul style="list-style-type: none"> Mixing accuracy increases productivity, saves energy and improves safety
	<ul style="list-style-type: none"> Environmental legislation demands a quiet environment 	<ul style="list-style-type: none"> Adaptive switching frequency control adjusts motor speed 	<ul style="list-style-type: none"> Reduced motor noise
	<ul style="list-style-type: none"> High torque application creates serious safety risk 	<ul style="list-style-type: none"> Safe torque off 	<ul style="list-style-type: none"> Improves operational safety
 Cooling towers	<ul style="list-style-type: none"> Belt driven cooling towers are costly to maintain due to mechanical parts wear 	<ul style="list-style-type: none"> Cooling tower package: Eliminates start-up current peaks, fewer parts, low noise level and increased safety 	<ul style="list-style-type: none"> Lower total cost of ownership through reduced maintenance costs



01



02

03

01 Direct torque control provides accurate mixing speed and torque control, and adapts to batch or continuous mixer control.

02 VSD/VFD provides precise, smooth and consistent control and synchronization of conveyor speeds.

03 Food Safe stainless steel motors can withstand extreme wash down conditions, helping them last 5 times longer than general purpose motors.



Features and functions benefiting meat, poultry and seafood processes

Drives, motors, PLCs and softstarters all play a vital part in keeping your production moving. Choosing the right product with the correct features is essential in ensuring an optimized production.



Variable speed drives/ variable frequency drives

Anti-cavitation software

- Extend pump lifetime and secure the process by detecting cavitation and ensuring optimal process or liquid flow

Energy efficiency

- Control operating costs by seeing energy costs in local currency, kWh and CO₂ emissions

Fieldbus compatible

- Use information such as flow rates to get the VSD/VFD to adjust motor speed and torque
- Get detailed insight into productivity performance and quality control through fieldbus comms connecting VSD/VFD with plant monitoring systems



Flying start

- Reduce wear and save time by starting a motor while the load is still spinning

Functional safety

- Safely stop applications like mixers and separators using in-built safe torque off (safety level SIL3)

Low harmonics

- Eliminate supply disturbances that could trip production with built-in active supply unit and integrated low harmonic line filter

Reduced noise

- Protect staff health and safety with lower motor noise through adaptive switching frequency control

Repeatability

- Accurately adjust conveyor speed to suit filling rates of products with varying viscosities

Soft pipe filling

- Increase lifetime of piping and pump system by avoiding pressure peaks

Ingress protection

- IP55 for washdown zones



Softstarters

Built-in bypass

- Reduce system complexity and size, saving time and money during installation
- Reduce heat generation from internal losses by activating bypass at full speed

Harsh environment use

- Ensure uninterrupted production in dusty or wet environments with IP66 keypad and coated electronics

Flexible communication

- Operate in local and remote mode by accessing all major communication protocols and built-in Modbus-RTU



Drive and motor packages

High efficiency motor and drive packages

- Save energy across the grain production process with high efficiency motors and drive packages

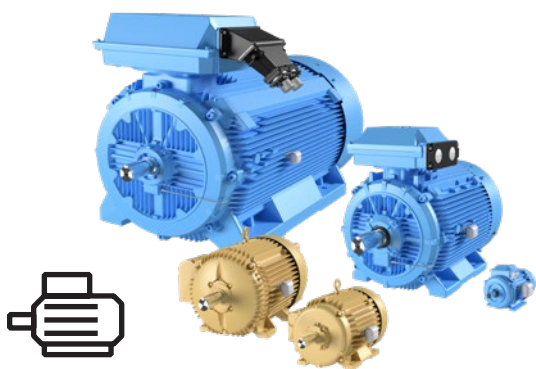
Cooling tower packages

- Reduce energy, vibration, noise and maintenance costs using a package that removes the gearbox from cooling towers
- Special low-speed permanent-magnet motor

Globally certified Ex drives and motors packages

- Protect plant and people and conform to global regulations using tested and certified motors and drives for potentially explosive atmospheres





Low voltage motors

Food zone 1

- IP69 for water rating ensures suitability for aggressive, clean in place washdown procedures
- Uses H1 grease to lower risk of food contamination

Splash zone 2

- Eliminate risk of paint chips entering food chain with paint free motor
- Uses H1 grease to lower risk of food contamination
- Surface is easy to clean

Dry zone 3

- Prevent dust explosions with certified dust ignition proof motors
- ABB Ability™ Smart Sensor ready
- Widest product offering

Stainless steel motors

- IP69 stainless steel motor ensures suitability for aggressive, clean in place washdown procedures



Programmable logic controllers (PLCs)

- Comprehensive range of scalable PLCs, I/Os and robust HMI control panels delivering performance, quality and reliability
- One integrated engineering tool for programming, simulation and commissioning for PLCs, safety, drives, control panels and network
- Flexible choice of network and fieldbuses to integrate I/O's, drives, HMI, Scada and 3rd party devices fulfilling the needs of tomorrow
- IIoT gateway functionality onboard the PLCs and control panels offer secure connection to cloud



From the factory floor to the cloud and beyond

ABB Ability™ Condition Monitoring for powertrains optimizes the performance and efficiency of electric motor-driven rotating equipment. It enables better decision making by providing real-time access to data on all parameters for drives, motors and general machinery.

1 Intelligent powertrain

The powertrain is equipped with sensors and cloud connectivity and can consist of motors, drives and general machinery.

2 Turning data into valuable insights

Data gathered through VSDs/VFDs' built-in sensors and loggers together with that collected from ABB Ability™ Smart Sensors fitted to motors and general machinery, can be collected, stored and further accessed via the cloud. The ability to gather and analyze this data insights paired with service expertise can reveal information on the status and condition of your equipment, so that service activities can be scheduled more effectively.



Accessing data for analytics

Detailed information can be extracted into a company's portal and systems. Information on many aspects of the meat, poultry and seafood process is available, including the ability to know exactly when and how production equipment was cleaned. Detailed dashboards give full transparency so that you can take actions that lead to less downtime, extended equipment lifetime, lower costs, safer operations and increased profitability.



Gain a digital advantage

While the data is always at your disposal, ABB service experts can work with you to provide help on how you analyze the data and define the steps for improving your operations.

Ensuring that the right person is exposed to the right information at the right time brings:

- Appropriate response to production challenges, lowering operating costs and product waste.
- Greater insight into various aspects of the meat, poultry and seafood process, thereby improving quality and reducing variations, errors and waste.
- Maximum material traceability helps fulfil regulatory compliance.
- Lower risk of production failure and change the maintenance from reactive to predictive.

Maintenance Manager



Energy Manager



Production Manager



Safety Manager



Our service expertise, your advantage

ABB Motion Services helps customers around the globe by maximizing uptime, extending product life cycle, and enhancing the performance and energy efficiency of electrical motion solutions. We enable innovation and success through digitalization by securely connecting and monitoring our customers' motors and drives, increasing operational uptime, and improving efficiency. We make the difference for our customers and partners every day by keeping their operations running profitably, safely and reliably.

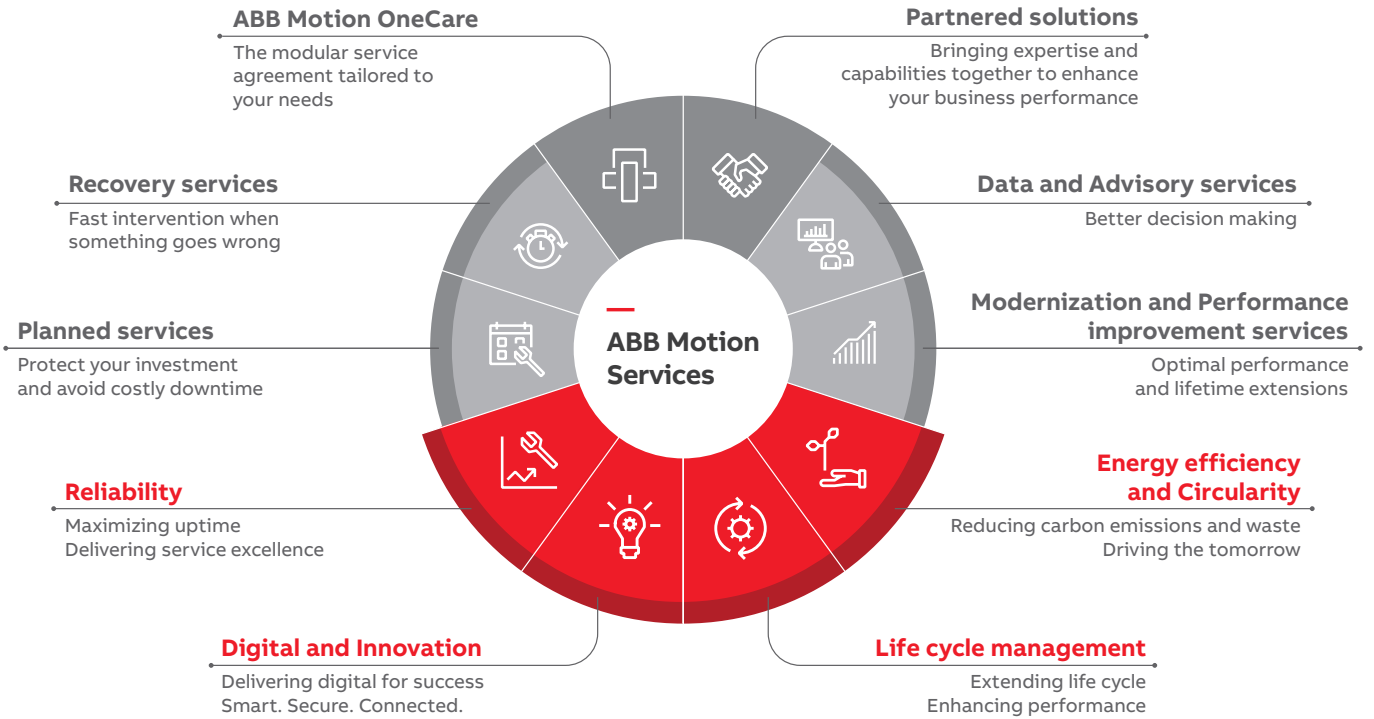
With a service offering tailored to your needs, ABB Motion Services maximizes the uptime and extends the life cycle of your electrical motion solutions, while optimizing their performance and maximizing your energy efficiency gains throughout the entire lifetime of your applications. We help to keep your applications turning profitably, safely, and reliably.

Digitalization enables new smart and secured ways to prevent unexpected downtime while optimizing the operation and maintenance of your assets. We securely connect and monitor your motors, drives or your entire powertrain to our easy to use cloud service solutions. Connecting your applications also gives you access to our in-depth service domain expertise.

We quickly respond to your service needs. Together with our partners, local field service experts, and service workshop networks, we provide and install original spare parts to help resolve any issues and minimize the impact of unexpected disruptions.

Our tailored to your needs service offerings and digital solutions will enable you to unlock new possibilities. Not only are we your premier supplier of motion equipment, we are your trusted partner and advisor offering support throughout the entire life cycle of your assets. We ensure your operations run profitably, safely and reliably and continue to drive real world results, now and in the future. Our service teams work with you, delivering the expertise needed to keep your world turning while saving energy every day.





OUR EXPERTISE
YOUR ADVANTAGE

With you, wherever you are in the world

Partnering with ABB, gives you access to some of the world's most innovative technology, expertise and solutions.

Global reach

ABB operates in over 100 countries with its own manufacturing, logistics and sales operations together with a wide network of local channel partners that can quickly respond to your needs. Stock availability is good, with short delivery times for many products backed by 24-hour spare parts delivery.

In addition, we work closely with grain producers to develop custom products, services and solutions to help standardize processes across multiple sites and streamline your supply chain.

We have several global R&D centers with thousands of technologists and considerable investments annually on innovation.

End-to-end product portfolio

Alongside its variable speed drives (VSDs)/ variable frequency drives (VFDs), motors and soft starters, ABB's automation offering includes a wide range of scalable PLCs, a selection of HMIs, instrumentation and robotics. With functional safety options, from built-in safe torque off in drives to safety PLCs, you can readily implement safety requirements.



ABB's offering includes:

- End-to-end **power and automation solutions**, from power distribution, raw material receipt, to process and machine control, to end of line packaging
- **Power protection and power quality solutions** to safeguard equipment and processes
- Industry leading **robotic automation solutions** that improve your speed-to-market, flexibility and help make packaging a differentiator
- A complete range of **protection, connection and wire management solutions** that

withstand harsh environments and extreme temperature swings, and provide the reliability needed for continuous operations

Streamline sourcing

ABB's end-to-end product and services portfolio streamlines your sourcing and purchasing activities and standardizes production across multiple sites, saving you money on spare part inventories while reducing maintenance costs.





For more information, please contact
your local ABB representative or visit

new.abb.com/drives

new.abb.com/drives/drivespartners

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