ABB motors, drives and services for the metals industry

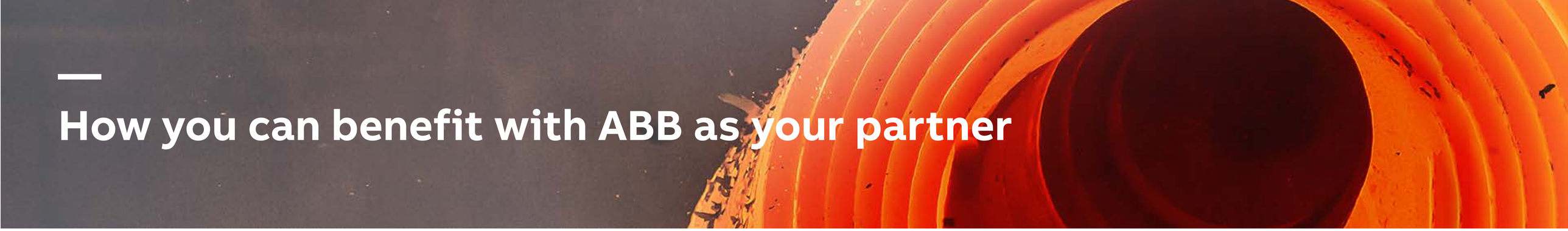
Improving efficiency and performance, boosting sustainability

START

An experienced partner with a full product range

With our broad range of drives and motors optimized for metals applications, and over 100 years of experience working with the industry, ABB is the ideal partner for producers looking to enhance efficiency, improve performance and extend lifetimes, supporting your sustainability targets.

We can provide the technology and solutions that can help you meet the market requirements for your industrial transformation journey. Partnering with us, you can optimize your operations by digitalizing your business, allowing you to save costs, reduce emissions and achieve your sustainability targets.



How you can benefit with ABB as your partner

Comprehensive portfolio and unrivalled expertise

We have been working with metals producers for over a century and our installed base in the industry already numbers tens of thousands of solutions. We understand how applications in various processes work across the entire plant, from raw material handling through production to water treatment and scrap management. We use this know-how to tailor solutions to meet the needs of the different applications, including demanding processes like steel rolling mills.

Our motors, drives and services portfolio covers a wide power range, enabling you to source the whole powertrain from a single supplier – an approach that reduces your engineering risk. For modernization projects that need flexibility of design, we also offer Engineered to Order and advisory solutions.

Maximized uptime with highly reliable motors and drives

ABB is provider for your electric motor driven rotating applications. We design and optimise the lifetime performance of the powertrain by ensuring your motors and drives are working seamlessly together, maximizing reliability and process uptime. This ensures reliable operation even in harsh environments with high temperatures and the presence of dust and other impurities.

Operational reliability is enhanced by features built into our products and supported by our services. Our solutions are built to meet the most demanding environments and to work in a reliable manner even in unstable electrical grid conditions.

Drives with active supply units are a great choice in situations where the supply voltage fluctuates. They can boost the output voltage, enabling full motor voltage when the supply voltage is below nominal. Multidrive systems with different redundancy options like OCOM (Ongoing Converter Operation Mode) enable an almost immediate restart, so production can continue even if there is a major failure in one of the supply branches.

High quality and performance through precise control

Our drives' direct torque control (DTC) and fast communication interfaces deliver precise motor speed and torque control – down to zero speed. The system reacts rapidly to load changes, an important benefit in applications with heavy and varying loads, like rolling mills. Precise motor control means accurate control of the production process, which translates into high quality products. In most applications there is no need for an encoder, a factor that not only saves money but also enhances reliability by reducing the equipment count.

Our digital solutions allow you to make better decisions regarding your equipment with the help of data insights and service expertise. For example, ABB Ability™ Condition Monitoring services enable easy access to condition data from equipment in locations that may be difficult or dangerous to reach. Moreover, with the help of augmented reality, service engineers can now provide their assessments remotely, minimizing potential health and safety risks, and reducing downtime and unexpected maintenance costs.

Keeping your people and equipment safe

Certified safety functions are integrated into our drives to keep your personnel and equipment safe. The drives comply with SIL 3 / PL e requirements for the highest machinery safety performance. Safety functions include Safe Torque Off, which brings equipment like shears and mill stands to a safe stop, and Safe Direction that ensures rotation is only allowed in the selected direction. Drive safety is also enhanced by fuseless design and electric arc protection functions.

Remote monitoring ensures personnel are kept away from potentially dangerous machinery. Virtual engineering and commissioning allow entire industrial processing lines and machines to be simulated without the need to run the hardware, enabling safe design.

Decarbonization

Emissions reduction is vital for the world's efforts to combat climate change. The iron and steel industry accounts for around seven percent of global carbon emissions and can make a significant contribution to a climate-neutral future.

The pressure for change is growing: customers and consumers are demanding action, emissions regulations are becoming stricter, and emissions prices are heading towards levels that will make low-carbon or fossil-free production attractive and viable.

Emissions reduction technologies that are under development include hydrogen-based steel production, and the capture, reuse and storage of carbon generated in metals processing. These are set to play an important role in the future solutions and technologies already available today – high efficiency motors, drives and services – provide an easy way for plants to cut emissions by improving energy efficiency. The large numbers of electric motors used throughout metals production mean there is plenty of scope for energy savings by modernizing older, less efficient products with energy efficient solutions.

Sustainability

- Efforts to raise the industry's level of sustainability include increasing production from recycled scrap metals. Producing steel from recycled scrap requires 1/8th of the energy needed to produce steel from iron ore.
- ABB can support producers with drives and motors for shredders, conveyors and other scrap management equipment.

Renewable energy

- Metals production is energy intensive, and plants can reduce emissions by switching to renewable sources like wind and solar power.
- ABB technologies can help to ensure the availability of steady supplies and competitive cost levels, which are two of the main factors currently limiting the uptake of renewables. In the U.S. major steel producers are already working on plants that will use wind and solar energy exclusively.

Digitalization and automation

- Digital technologies offer opportunities to raise productivity while improving efficiency, safety and overall performance. At the same time they enable faster maintenance and help to shorten downtime.
- Systems are increasingly using artificial intelligence, as well as cloud-based storage to ensure that data is available whenever and wherever it is needed. ABB variable speed drives facilitate digitalization and automation, allowing for remote monitoring and precise performance control.

Energy efficiency and carbon neutrality

Energy represents around 20 percent of the manufacturing cost of steel – but is also key to reducing carbon dioxide emissions.

High efficiency motors can play a major role in cutting emissions, and the savings are especially significant for variable loads utilizing rotating applications driven by electric motors, where electricity consumption is the largest single cost factor during their lifetime.

Combining high efficiency motors with variable speed drives further boosts the savings. Many pump and fan applications that need a variable rate of flow are operated with the motor running at full speed and a mechanical throttle, valve, or vent to restrict the flow to the required level. Using a variable speed drive to regulate the speed of the motor according to the needs of the process can produce significant energy savings. Replacing direct-on-line starting with a high efficiency drive-motor package can lower energy costs by up to 60 percent. In processing lines involving cyclic or continuous braking, a regenerative drive can recover braking energy and feed it back to the network for use by other equipment.

Our advisory and modernization solutions for aging rotating equipment not only extend its lifetime but also optimize its performance and enable greater energy efficiency and reduced electricity consumption. You will have a transparent overview of when your equipment might become obsolete, while offering you a seamless transition between old and new products for a continuous service support and to avoid premature scrapping.

Moreover, our digital solutions enable you to analyze your operational data more intelligently, providing insights to energy efficiency improvements and help you to reduce carbon emissions and bring down your overall operation and maintenance costs.

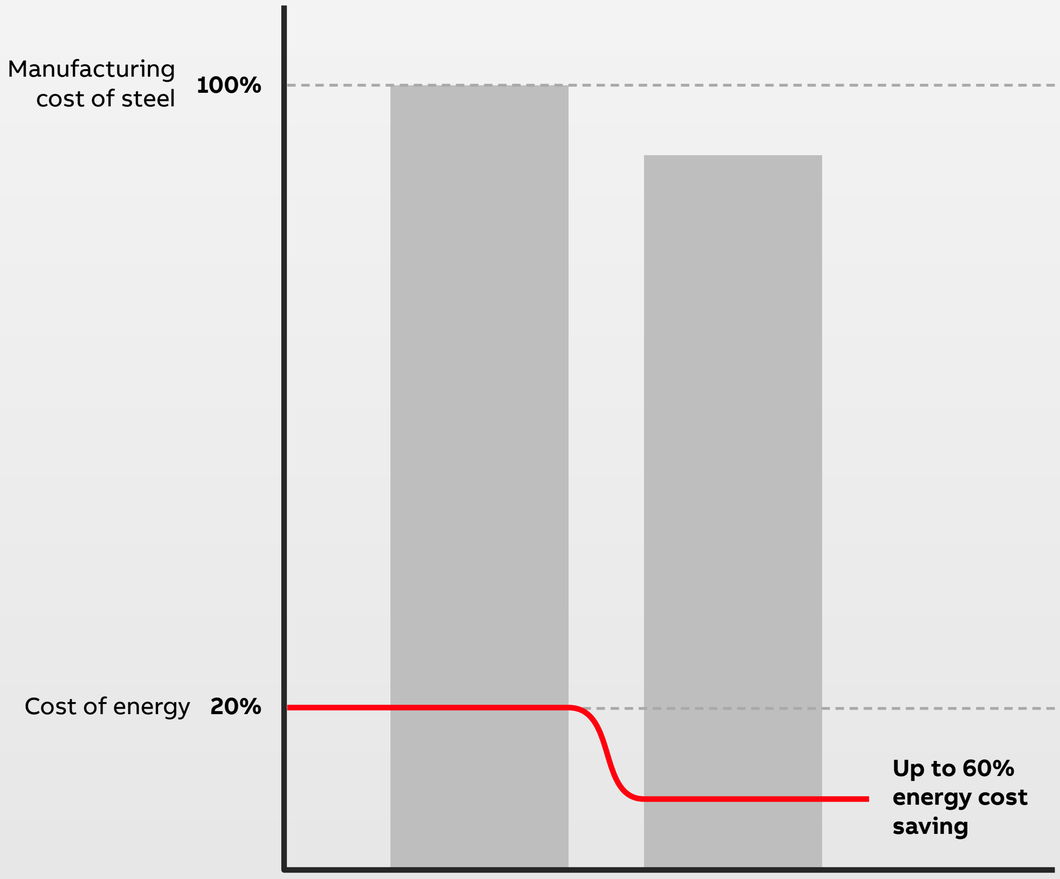


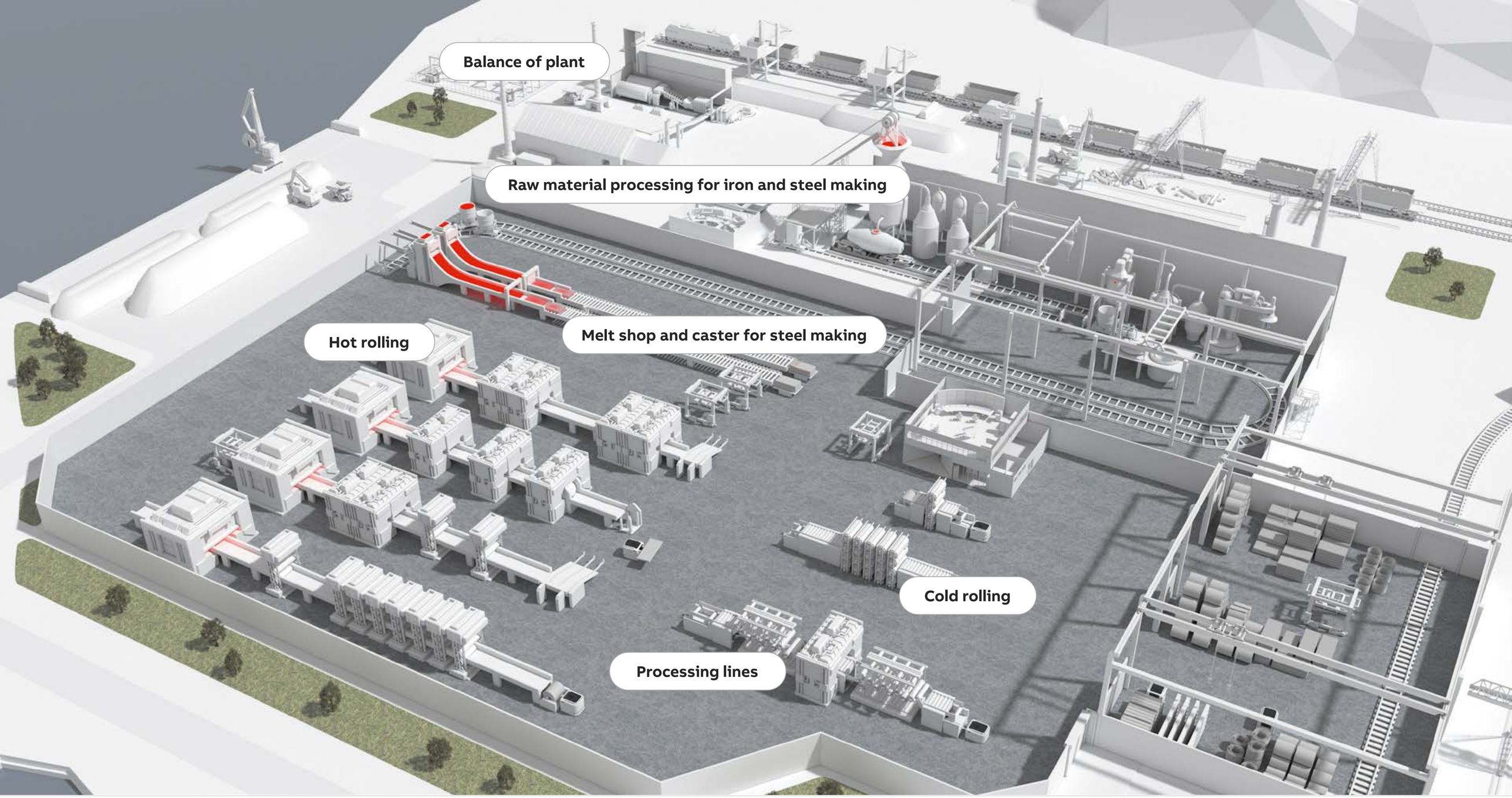
ABB Ability™ Condition Monitoring for powertrains

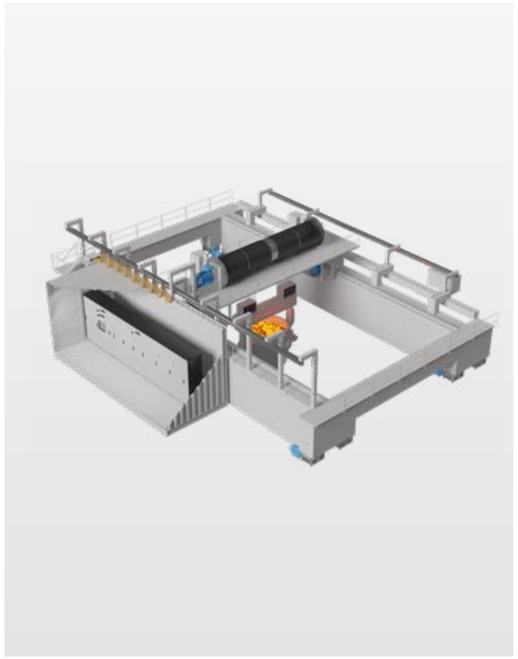
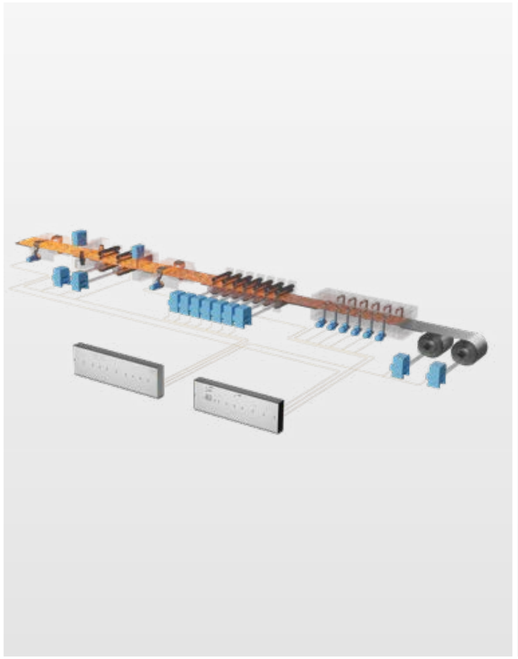
The ABB Ability™ Digital Powertrain is a suite of digital solutions that enables you to remotely monitor the health and performance of powertrains, including drives, motors and applications, such as pumps.

Data from motors, bearings, gearing and pumps is collected using Smart Sensors and combined with the data collected by directly from drives. The collated data can be accessed and analyzed remotely, providing a clearer picture of the maintenance needs and energy efficiency of the entire process.

Benefits

- Maximized availability
- Optimized performance and energy efficiency
- Extended equipment lifetime
- Improved safety

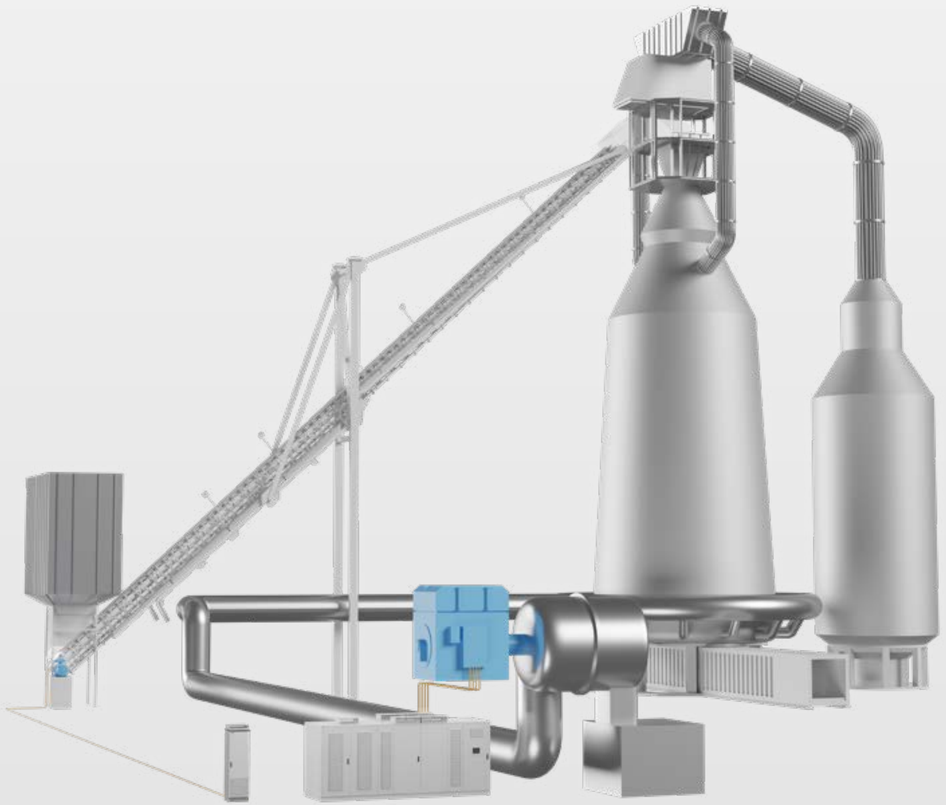

Balance of plant
Raw material processing for iron and steel making
Hot rolling
Melt shop and caster for steel making
Cold rolling
Processing lines

ABB’s Motors and Drives deliver the necessary energy to keep the process running

Our products are designed to operate in all metals applications, providing precision and reliability with high energy efficiency. They are part of the automation system.

Raw material processing for iron and steel making



Examples of motors and drives applications and offering:

BLOWERS IN BLAST FURNACE

Motors:
Synchronous motors
(type AMS)

Drives:
MEGADRIVE-LCI, ACS5000

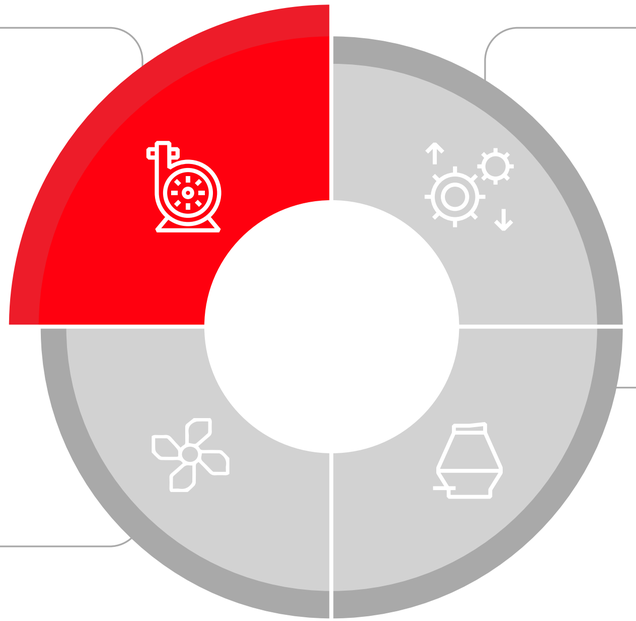
Requirements:
- Energy saving
- Soft starting
- Accurate speed and torque control

FANS, IN COKE AND PELLET PLANTS

Motors:
Induction motors
(type M3BP, AMI, AXR)

Drives:
ACS880, ACS2000, ACS580MV

Requirements:
- Energy saving
- Soft starting
- Accurate speed and torque control



ELEVATORS IN COKE PRODUCTION

Motors:
Low voltage process performance motors

Drives:
ACS880

DIRECT REDUCED IRON (DRI)*

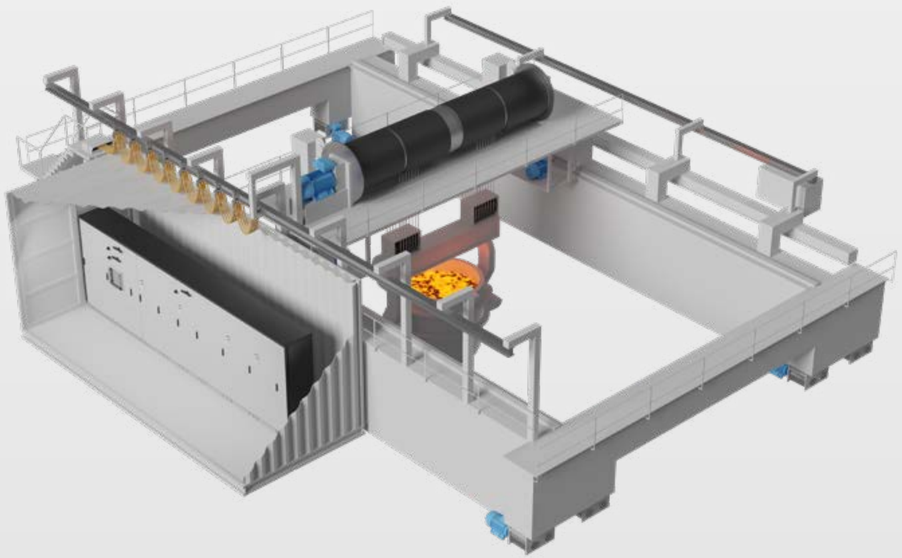
Motors:
Induction motors
(type M3BP, AMI, AXR)

Drives:
ACS880, ACS2000, ACS580MV

Requirements:
- Energy saving
- Soft starting
- Accurate speed and torque control

***alternative process to coke, pellet and blast furnace**

Melt shop and caster for steel making



Examples of motors and drives applications and offering:

LADLE CRANES

Motors: Low voltage process performance motors

Drives: ACS880, multidrives and modules

Requirements:
- Constant torque
- Limited space
- Hot, dusty environment
- Accurate positioning
- Accurate speed and torque control

VACUUM PUMPS FOR DEGASSER

Motors: Low voltage process performance motors

Drives: ACS880

Requirements:
- Energy saving
- Accurate speed and torque control
- High IP class

FANS IN DE-DUSTING

Motors: Low or high voltage Induction motors (type M3BP, AMI, AXR)

Drives: ACS880, ACS2000, ACS580MV

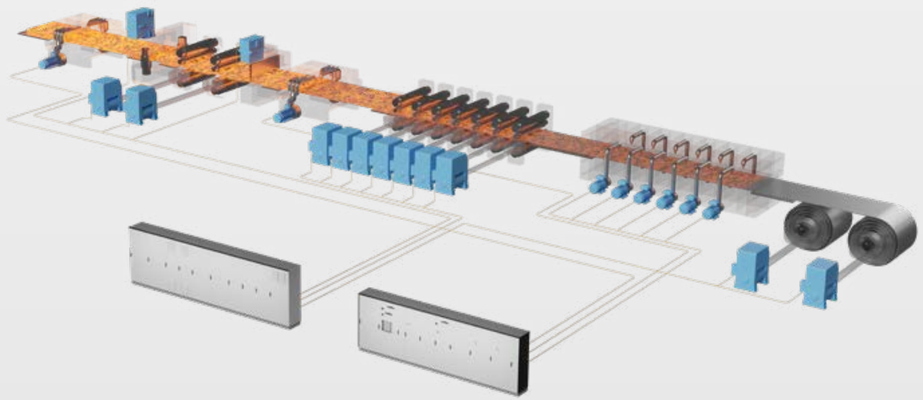
Requirements:
- Energy saving
- Soft starting
- Accurate speed and torque control

SPRAY COOLING PUMP AND ROLLS FOR CASTER

Motors: Low voltage process performance motors

Drives: ACS880

Hot rolling



Examples of motors and drives applications and offering:

MILL STANDS, EDGERS, COILERS

Motors:
AMZ synchronous motors, modular motors NXR and AXR

Drives:
ACS880, ACS6080, DCS880 for existing DC-motors

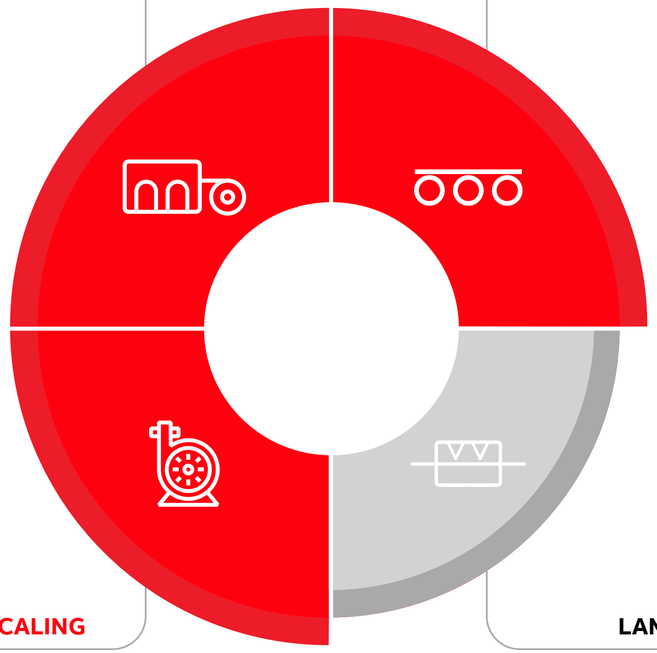
Requirements:
- High overloads and dynamic performance, to ensure quality of end product
- Safety of personnel and machines
- Reliability and production availability
- Torque from zero speed
- Accurate positioning
- Regeneration capability
- Common DC-bus for energy balancing

ROLLER TABLES

Motors:
Low voltage induction roller table motors

Drives:
ACS880

Requirements:
- High overload, fast response
- Accurate speed and torque control
- Torque from zero speed
- Accurate positioning
- Regeneration capability
- Common DC-bus for energy balancing



HIGH PRESSURE PUMPS IN DESCALING

Motors:
Low voltage inductions motors, high voltage rib cooled motors NXR and AXR

Drives:
ACS880, ACS2000

Requirements:
- Fast response to dynamic load profile
- Energy saving

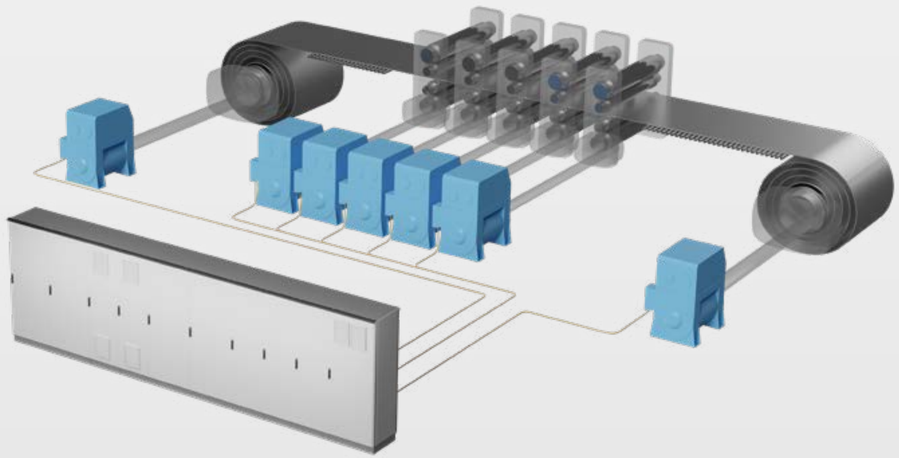
LAMINAR COOLING PUMPS

Motors:
Low voltage process performance motors, SynRM

Drives:
ACS880

Requirements:
- Energy saving
- Accurate and dynamic speed control

Cold rolling



Examples of motors and drives applications and offering:

MILL STANDS

Motors:
AMZ Synchronous motors, AMI induction motors

Drives:
ACS880, ACS6080, DCS880 for existing DC-motors

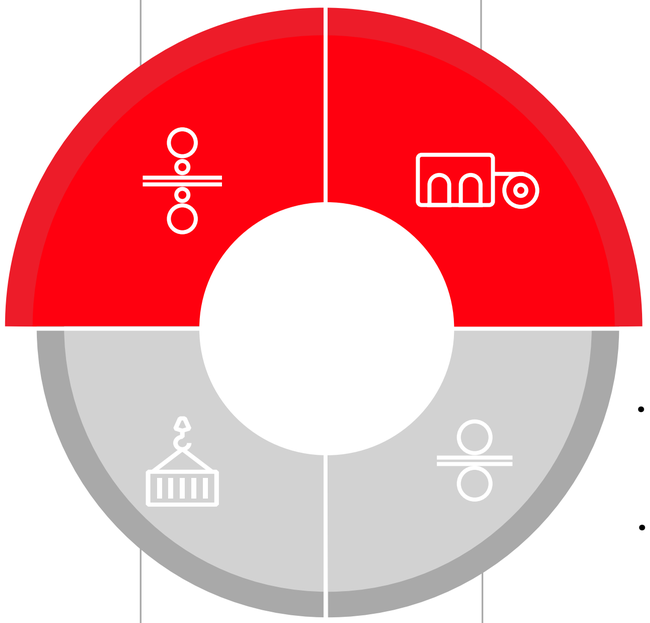
Requirements:
- High overload, fast response, to ensure quality of end product
- Safety of personnel and machinery
- Reliability and production availability
- Accurate speed and torque control
- Torque from zero speed
- Accurate positioning
- Regeneration capability
- Common DC-bus for energy balancing

COILERS AND UNCOILERS

Motors:
Low or high voltage modular motors NXR and AXR, AMZ synchronous motors

Drives:
ACS880, ACS6080, DCS880 for existing DC-motors

Requirements:
- High overload, fast response
- Accurate speed and torque control
- Torque from zero speed
- Accurate positioning
- Long constant power speed-range
- Regeneration capability
- Common DC-bus for energy balancing



MATERIAL HANDLING CRANES

Motors:
Low voltage process performance motors

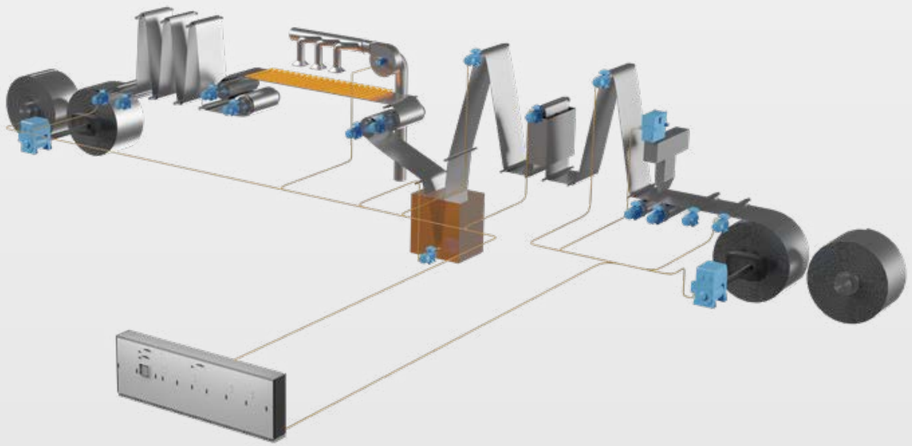
Drives:
ACS880, multidrives and modules

PINCH ROLLS

Motors:
Low voltage process performance motors

Drives:
ACS880, multidrives and modules

Processing line



Examples of motors and drives applications and offering:

BRIDLE AND PINCH ROLLS

Motors:
Low voltage process performance motors

Drives:
ACS880, multidrive and modules, DCS880 for existing DC-motors

Requirements:
- Accurate motor torque for the very high accuracy tension control in a processing line
- Accurate speed control for coordination of up to hundreds of motors
- Fast response
- Regeneration capability
- Common DC-bus

SHEARS AND SLITTERS

Motors:
Low voltage process performance motors

Drives:
ACS880, multidrives and modules

ENTRY AND EXIT COILERS

Motors:
Low voltage process performance motors, AMI Modular motors

Drives:
ACS880, multidrives and modules DCS880 for existing DC-motors

Requirements:
- Accurate motor torque for the very high accuracy tension control in a processing line
- Safety of personnel and machines
- Reliability and production availability
- Torque from zero speed
- Long constant power speed-range
- Accurate positioning
- Regeneration capability
- Common DC-bus for energy balancing

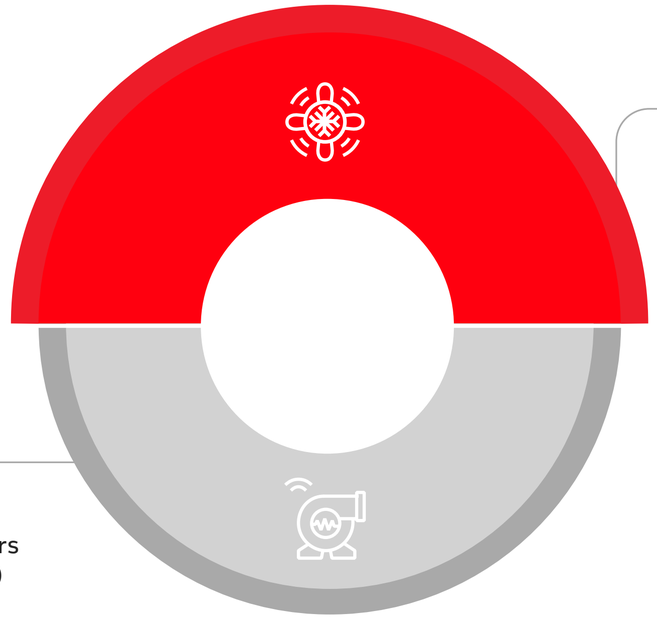
FURNACE HEATERS

Drives / Power controllers:
DCT880

Requirements:
- Accurate power control

Balance of plant

Examples of motors and drives applications and offering:



WATER TREATMENT PUMPS

Motors:
High voltage modular induction motors (type AMI, NMI), high voltage rib cooled motors NXR, Synchronous reluctance motors (SynRM)

Drives:
ACS880

COMPRESSORS IN AIR SEPARATION UNITS

Motors:
Synchronous motors (type AMS)
Modular induction motors (type AMI), Rib cooled motors

Drives:
MEGADRIVE-LCI, ACS5000

Requirements:
- Energy saving
- Soft start and synchronization
- Sufficient power capacity (~>10 MW)

ABB motors and drives for the metals industry

Product offering and technical specifications

Motors and drives play a vital part in keeping production moving. Choosing the right products is essential for ensuring optimized production.

IEC low voltage motors

SynRM motors

Energy efficiency

- IE5 SynRM motors with VSDs can reduce energy losses by 50% compared to IE2 induction motors and 40% compared to IE3
- Replacing legacy motors with SynRM and VSD typically reduces energy bills by 14 to 25%
- High efficiency also at partial loads

Customizable for the application

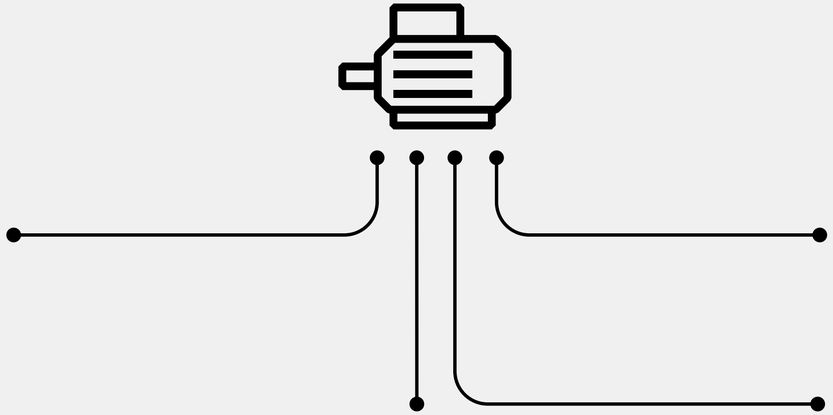
- Designed for VSDs
- SynRM motors deliver full torque from zero speed – ideal for applications like extruders where accurate speed and torque control can help to improve product quality, reduce waste and cut the number of rejected products
- Matching customer needs with tailor-made options

Reliability

- Lower losses mean SynRM motors run cooler
- This means a longer lifetime for the stator windings, bearings and bearing lubricant
- A temperature reduction of 10 degrees means the winding lasts twice as long
- And a reduction of 15 degrees doubles the lifetime of the bearing lubrication

Sustainability

- A drop-in replacement for induction motors
- SynRM motors are easy to service and environmentally friendly
- SynRM motors do not contain magnets or rare earth metals



Process performance motors

Customizable for any application

- Designed for the most demanding applications with highest reliability, for DOL or VSD use
- Matching customer needs with tailormade options
- Modular concept offering flexibility with wide range of options (encoders, brakes, monitoring sensors)

Reliability

- Well established design and widely available technology
- Designed for highest reliability in 24/7 operation
- IP55 protection as standard to withstand dust and other impurities

High energy efficiency

- Several efficiency classes up to IE5

High dynamic performance motors

Customizable for harsh conditions

- Designed for VSD use
- Optimized electrical and mechanical designs for demanding applications in rough operating conditions
- Modular concept offering flexibility with wide variety of options (encoders, brakes, monitoring sensors)

Reliability

- Compact and robust design offering superior power density
- The square frame design and the high overload capacity gives the motor an excellent dynamic response due to low inertia and high pulse torque

Fit for purpose

- Full range from one supplier
- Same output from a smaller motor
- Quick and easy installation

Roller table motors and drive packages

Customizable for the application

- Designed for VSDs, low speeds and high torque
- Speed control possible without encoder
- Cabling can be arranged different directions
- Heavy duty brakes and encoders an option

Reliability

- Shock resistant mechanical and winding design
- Designed to withstand high ambient temperature, humidity, water sprays, dust or other fine particles
- Totally enclosed motor structure protects against moisture and dust –ingress protection up to IP66
- Stator frame can be pressurized with air to prevent any ingress of water or dust

IEC low voltage motors

Roller table motors

Power range
- From 3.3 to 165 kW
- Torque Tmax 30 000 Nm, above 30 000 Nm on request

Frame size
- IEC 180–450
- IEC 160 available on request

Link to website

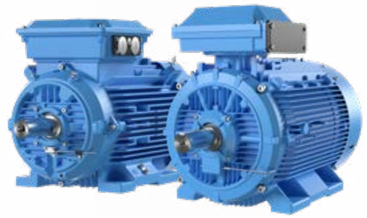
SynRM motors

Power range
- From 5.5 to 315 kW

Efficiency class
- IE5

Frame size
- IEC 132 - 315

Link to website



Process performance motors

Power range
- From 0.12 to 1000 kW

Efficiency class
- IE2, IE3, IE4

Frame size
- Cast iron M3BP–IEC frame sizes 71 to 450
- Aluminum M3AA–IEC frame sizes 56 to 280

Link to website

High dynamic performance motors

Power range
- From 2 to 2000 kW

Frame size
- IEC 80–400

Link to website

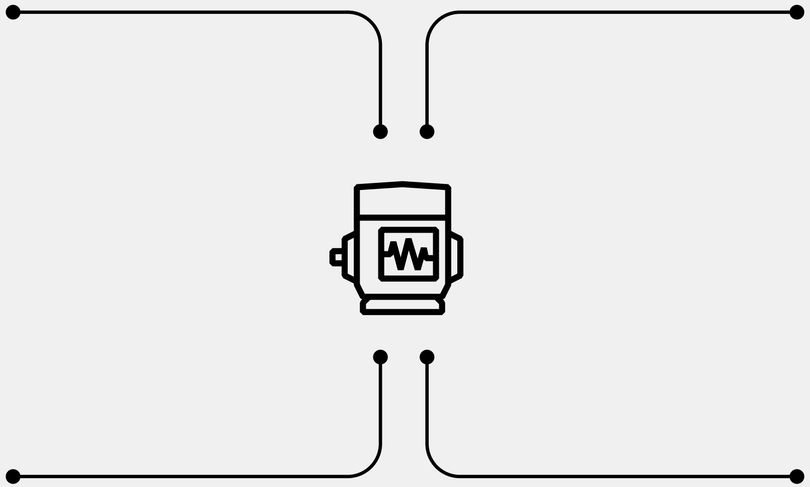
Synchronous and induction motors

Versatile product range

- IEC and NEMA standards
- All cooling methods are available from rib cooled, water cooled, air-to-water through air-to-air cooling
- Protection classes for different environments: from IP 55 to IP 66

Standard and tailored solutions

- Modular platform for customization – cooling system, bearing type, shaft end, foot types, lubrication system, can be selected according to customers' needs
- Highly engineered for demanding processes



Modernization with minimized production downtime

- The footprint and layout of the new motor can be engineered to match the original – enables the use of the existing foundation and base frame without major modifications

Reduced total cost of ownership

- The cost of the energy used by an electric motor soon adds up to the motor's purchase cost (CAPEX). ABB motors deliver high efficiency, helping our customers to minimize their operating costs (OPEX)
- The exceptional thermal and mechanical properties of the proven MICADUR® Compact Industry insulation system enable ABB motors to achieve the highest availability

Synchronous and induction motors

Synchronous motors AMZ

Power range
- Up to 65000 kW

Frame size
- IEC size 710 to 2500

Link to website

Modular induction motors AMI

Power range
- 140 to 23000 kW

Frame size
- IEC sizes 400 to 1000

Link to website

Rib cooled motors AXR

Power range
- 100 to 1800 kW

Frame size
- IEC sizes 315 to 500

Link to website

Drives

Uninterruptable operation in weak and unstable networks

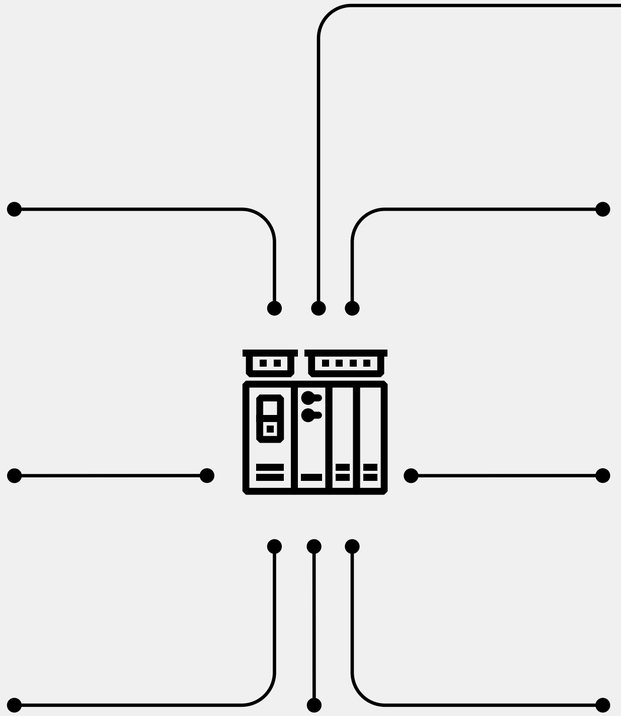
- Drive is able to withstand short supply voltage cut-offs by continuing to operate utilizing kinetic energy of the rotating motor. Normal operation resumes immediately after the voltage is restored
- Drives equipped with active supply units are able to boost the output voltage, enabling full motor voltage even when the supply voltage is below nominal

Process control according to demand

- Motor speed regulation according to process requirements – significant energy savings compared to running motors at full speed or using mechanical control
- Accurate control even without speed or position feedback encoder

Safety

- Certified safety functions comply with the highest safety performance requirements for machinery
- All cabinets have arc resistant design. MV cabinets have arc elimination and LV cabinets can have optical arc protection
- Door interlock system as standard in MV cabinets and optional for LV cabinets
- Protection functions – against motor overspeed, overload etc.



Reliability

- Each drive is factory test at full load to ensure maximum reliability. Testing includes performance and all protective functions at full load
- High quality components
- ABB Ability™ Preventive Maintenance service, enables longer service intervals

Connectivity to plant's control system

- Plug-in adapters enable control interface and communication with all major industrial automation networks, offering detailed insight into drive’s performance

Ready-made solutions and functions

- Synchronous machine control, for slow speed-high torque applications like coilers
- All cabinet drives can be engineered to order

Energy efficiency

- Regenerative drive can feed braking energy back to the network. This energy can then be utilized by other equipment
- ABB active front end (AFE) has a unity power factor, reducing the need for additional equipment for reactive power compensation, such as filters and large capacitor banks. This can also help to avoid penalty charges from electric utilities for reactive power

Clean supply network

- Low harmonic drives exceed the requirements of the most stringent harmonic recommendations, resulting in cleaner supply network and less disturbance to electrical equipment connected to the same network
- Drive with AFE offers possibility of network power factor correction to compensate for low power factors of equipment on the same network

Industrial low voltage drives

ACS880

Power range
- From 0.55 to 6000 kW, 230 to 690 V

Suppy unit (harmonics)
- Diode 6- and 12-pulse, liquid cooled also 24-pulse
- IGBT (Ulta-low harmonic/ regenerative)

Type of motor
- Induction
- Permanent magnet
- SynRM
- Externally excited synchronous motors
- ATEX motors

Applications
- Any low voltage applications

Cooling type
- Air and liquid cooled

Link to website

DCS880

Current range
- From 20 A to 5200 A, 400 to 1200 V

Suppy unit (harmonics)
- 6-, 12- or 24- pulse thyristor based, 2Q or 4Q

Type of motor
- DC motors

Applications
- Rolling mills, tube mills, roller tables, wire drawing, processing lines

Cooling type
- Air cooled

Link to website

DCT880

Current range
- 20 A to 4160 A, 110 to 690 V

Suppy unit (harmonics)
- Thyristor based
- No harmonics in full wave control
- In phase angle control the harmonics vary"

Type of motor
- Non motor applications

Applications
- Annealing, heating and melting (resistive, inductive or infrared)

Cooling type
- Air cooled

Link to website

Industrial medium voltage drives

ACS1000

Power range
- From 315 kW to 5 MW, 2.3 to 4.16 kV

Suppy unit (harmonics)
- 12- or 24- pulse diode rectifier with external or integrated transformer

Type of motor
- Induction motor

Applications
- Fans, pumps

Cooling type
- Air or liquid cooled

Link to website

ACS2000

Power range
- From 250 kW to 3.68 MW, 4.0 to 6.9 kV

Suppy unit (harmonics)
- 18- to 24-pulse diode rectifier (low harmonic) with integrated transformer

Type of motor
- Induction motor

Applications
- Fans, pumps

Cooling type
- Air cooled

Link to website

ACS6080

Power range
- From 5.0 to 36.0 MW, up to 3.3 kV

Suppy unit (harmonics)
- 6-, 12- or 24-pulse diode rectifier
- 6-, 12- or 18-pulse active rectifier (low harmonic / regenerative)

Type of motor
- Induction motor
- Synchronous motor
- Permanent magnet motor

Applications
- Rolling mills, coilers, big pumps and fans

Cooling type
- Liquid cooled

Link to website

General purpose medium voltage drives

ACS580MV

Power range
- From 200 kW to 6.3 MW, 3.3 to 11 kV

Suppy unit (harmonics)
- 18- to 24-pulse diode rectifier (low harmonic) with integrated transformer

Type of motor
- Induction motor

Applications
- Fans, pumps

Cooling type
- Air cooled

Link to website

ACS5000

Power range
- From 3.0 to 36.0 MW, up to 13.8 kV

Suppy unit (harmonics)
- 36-pulse diode rectifier
- optionally 18-pulse for frames 1 and 2 for liquid-cooled ACS5000s

Type of motor
- Induction motor
- Synchronous motor
- Permanent magnet motor

Applications
- Blast furnace blowers, fans and pumps

Cooling type
- Air or liquid cooled

Link to website

Global support available locally

At your service

Link to our website

● Global and regional service hubs supporting countries

● Local service presence

Over 130
years servicing our customers

Over 1,200
field service engineers

~ 600
service partners

services in more than
70 countries

~ 50
service workshops

ABB Motion Services for Metals

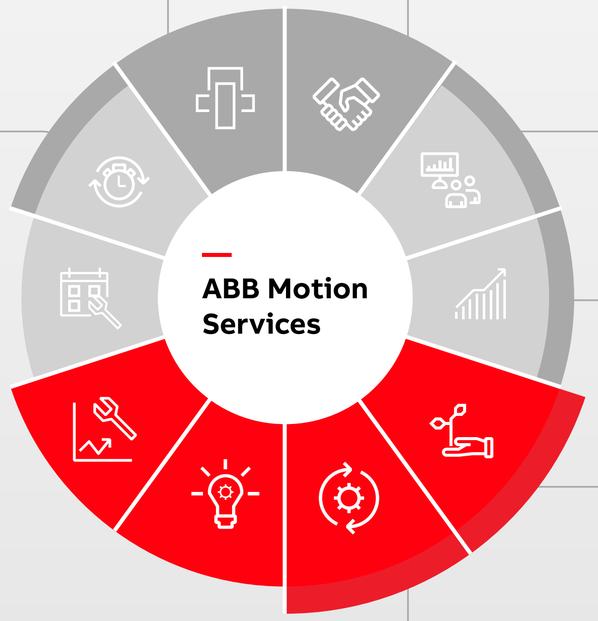


ABB Motion OneCare

The modular service agreement tailored to your needs

Recovery services

Fast intervention when something goes wrong

Partnered solutions

Bringing expertise and capabilities together to enhance your business performance

Data and Advisory services

Better decision making

Modernization and Performance improvement services

Optimal performance and lifetime extensions

Energy efficiency and Circularity

Reducing carbon emissions and waste Driving the tomorrow

Life-cycle management

Extending life circle
Enhancing performance

OUR EXPERTISE
YOUR ADVANTAGE

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