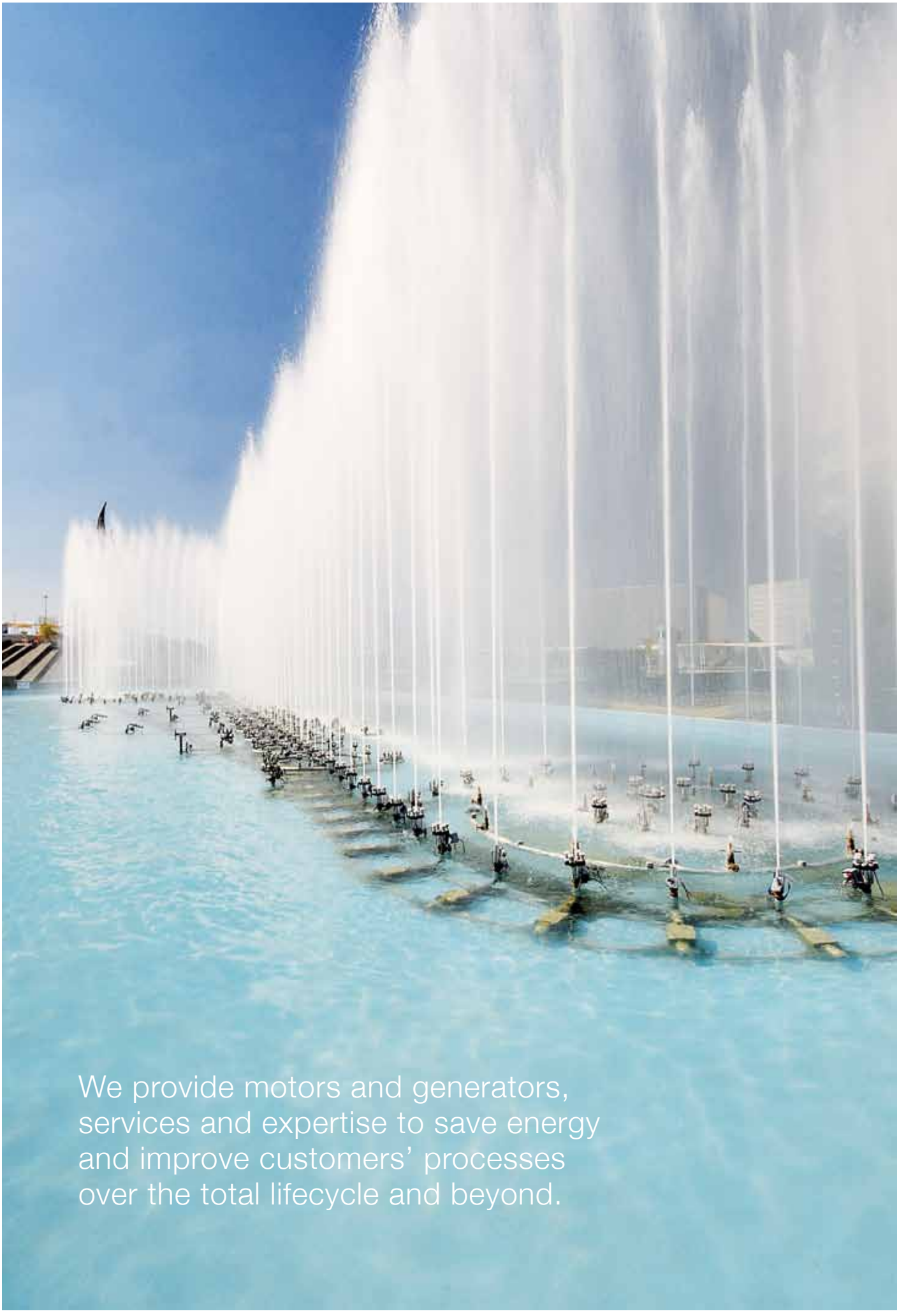
Low voltage AC motors and drives

Super premium efficiency synchronous motor and drive package
Taking energy efficiency to a new level

Power and productivity
for a better world™


We provide motors and generators,
services and expertise to save energy
and improve customers' processes
over the total lifecycle and beyond.

Super Premium Efficiency
The name speaks for itself

Based on reluctance motor technology, ABB's super premium efficiency motor drive package meets the upcoming IE4 energy efficiency standard throughout its power range. Customers will enjoy substantial energy savings and record-short payback times compared to using conventional motor and drive systems.

Up to 40% lower energy losses
ABB's new motor and drive package allows customers in many industry segments to save significant amounts of energy. Due to the motor's superior efficiency, energy losses can be reduced by up to 40 % in industrial applications. In many cases, the payback time is less than two years.

Designed for VSD operation
Electric motors account for up to 65 percent of consumed electricity in industrial applications. Therefore motor efficiency plays a crucial role in minimizing life cycle costs. Designed exclusively for variable speed drive (VSD) operation, ABB's new motor drive package further adds to total energy savings, while providing smooth and efficient process control. For example, running a pump or a fan at 80 percent speed instead of at full speed can cut the energy consumption in half.

One supplier for the total package
Customers are offered a complete motor drive package including motor, drive and software, which guarantees total system efficiency. By combining its extensive motor and drive skills, ABB has succeeded in optimally controlling and commercializing reluctance motor technology.

Dimensions harmonized with IEC/Cenelec
Dimensions are harmonized with IEC/Cenelec standards, which makes the motor fully interchangeable with an induction motor. Comparable in output and frame size, the motor can be retrofitted into existing installations without extensive engineering work and production standstill.

Combining novel rotor and proven stator technology
The motor combines innovative rotor technology and conventional stator technology, which is proven in thousands of induction motors worldwide. Designed without windings, the new rotor has basically no loss at all, which keeps it uniquely cool. ABB has managed to convert this temperature advantage into super premium efficiency and extended bearing lifetime.

Extended bearing lifetime
Bearing failure causes about 70 percent of unplanned motor outages. Due to the low motor temperature, the bearing's lifetime is extended while greasing intervals are shortened. This brings down maintenance costs and improves reliability. Even if a bearing eventually needs replacing, there are no magnetic forces involved – unlike a permanent magnet motor – which makes it as easy to change the bearing as it is in an induction motor.

Summary of customer benefits
- A revolutionizing technology package based on reluctance motor technology
- High efficiency – comparable to efficiency class IE4*
- Reduces energy losses by up to 40 percent compared to conventional solutions
- Short payback time – in many cases less than two years
- Comes as a packaged solution with matched motor, drive and software
- Guaranteed total system efficiency and optimized process control
- Simple and service friendly design without magnets
- Reliable due to cooler bearings and no rotor windings
- Longer bearing service intervals due to low operating temperature
- Fully interchangeable with induction motors due to IEC/Cenelec compliance

*** The motor is comparable to efficiency class IE4 for direct-on-line (DOL) operated motors, even when including the extra harmonic losses induced by VSD operation.**

Successfully driving and controlling synchronous reluctance machine technology

The high efficiency of synchronous reluctance motors has been recognized a long time – at least in theory. By combining its leading motor and drive competencies, ABB has been able to optimally drive the motor and package a solution that addresses general industrial applications on a global scale.

Overcoming reluctance motor challenges

Reluctance motors are renowned for their high efficiency at low cost. However, the complexity of designing and controlling the motors has thus far prevented a large-scale commercial breakthrough. ABB has overcome these challenges by successfully packaging motor, drive and advanced new software.

Sinusoidal waveform

Unlike a switched reluctance motor, which is a stepper motor, currents in the stator windings in ABB's super premium efficiency synchronous reluctance motor are sinusoidal, as in induction motors. This allows the rotor to run smoothly and efficiently in continuous motion.

Novel rotor design

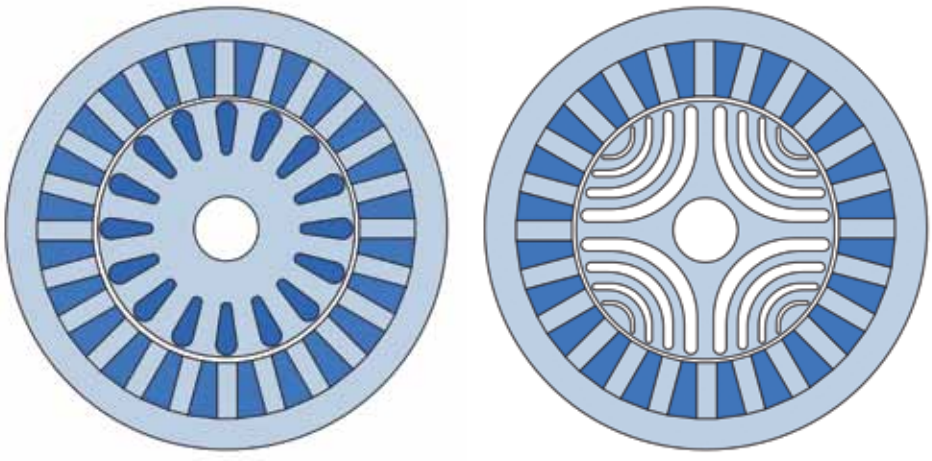
The rotor's iron is based on the same laminated iron used in the stator, and is stacked axially in a similar manner. The rotor cross section has a four pole structure with four high permeable (low magnetic reluctance in iron) axes and four low permeable (high magnetic reluctance in air) axes.

Compact, flexible and safe drive technology

The compact design of the low voltage AC drive makes it ideal for cabinet installation. Depending on the application, the drive can be programmed in a variety of ways. Integrated safety functions ensure safe operation of the application, without needing to install any external safety devices.

Direct torque control for improved productivity and reliability

At the heart of the drive is the motor control platform, ABB's direct torque control (DTC) feature. DTC helps control the motor from standstill to maximum torque and speed without the need for position sensors or encoders, which brings down investment costs. The feature also enhances reliability by preventing unnecessary trips or process interruptions.



Induction motor

Super premium efficiency synchronous motor

Proven stator, innovative rotor. ABB's super premium efficiency synchronous motor has no rotor windings, which minimizes losses. The rotor's iron is the same as in the stator and is stacked axially. The rotor cross section has a four pole structure.

Challenging existing motor technologies in a wide range of industry segments


1


3


4

1 Pumps | 2 Fans | 3 Hydraulics | 4 Cranes

Customers in many industry segments benefit from the super premium energy efficiency and reliability of ABB's new synchronous reluctance motor drive package.

Demand for green energy applications is growing stronger every year. ABB offers customers an opportunity to respond to the challenge.

Fans, pumps, compressors and conveyors are examples of continuous processes that depend on the efficient use of energy and uninterrupted operation to achieve cost efficiency.

Through its combination of energy efficiency, reliability and standard dimensions, ABB's motor drive package perfectly meet these demands – challenging existing technologies in a large number of industry segments.

Applications
Fans
Pumps
Compressors
Hydraulics
Conveyors
Cranes
Extruders

Industries
Pulp and paper
Metals
Ventilations
Power plants
Sawmills
Mining
Water and waste water
Food and beverage
OEM customers

The ABB advantage

ABB motors and drives are a long-term investment requiring first class products and premium long-term support. As a global supplier of advanced technical products, we offer customers a comprehensive support organization.

Quality products

ABB is the leading international motor and drive manufacturer offering top quality products, short response times and a global manufacturing footprint.

Customer support

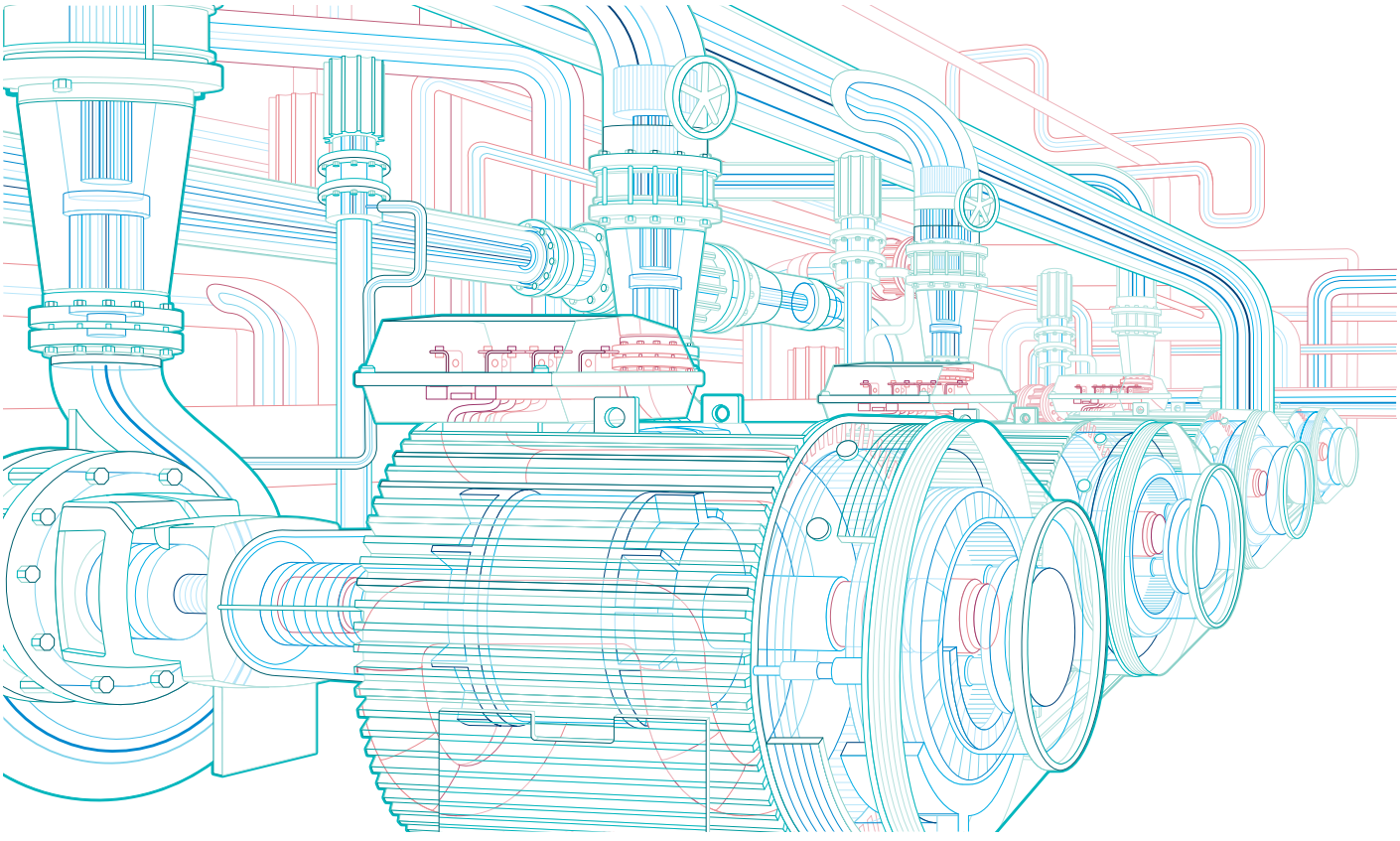
Customers are offered support wherever they are. ABB is present in more than 100 countries, so even though support is global it also has the benefits of being local. Customer support is provided from prototype all the way through the operation and maintenance stages.

Service and maintenance

Motors and drives are designed to allow quick and easy maintenance, which minimizes maintenance costs and downtime. Our network of service workshops provides global coverage. The service organization has broad experience of motors, drives and their applications and can thus provide improved operational availability and life cycle profitability for customers.

Low life cycle cost

Based on information and experience related to maintenance schedules and costs, we use life cycle management models to plan effective preventive maintenance procedures. This helps users reduce total life cycle costs.



At the forefront of motor and drive development since 1890

ABB has been at the forefront of motor and drive development for 120 years. ABB's motor business dates back to 1890 when the Group was granted a three-phase patent. This made it possible to commercialize motors driven by alternating current.

Since then, we have continued our tradition of being first in motor and drive innovation. In 1922, we were the first to replace journal bearings with ball bearings, dramatically improving motor efficiency.

In 1946, we introduced aluminum motor frames, allowing the design of lighter motors. In 1975, we launched our first AC drive system and, in 1976, the first motor frame made of profiled sheet steel, which introduced a step change in cooling performance.

Our initiative to introduce an international motor standard in 1947 made electric motors a global mass-market product by allowing the use of standard components.

Today, we add another milestone to our success story. ABB has managed to optimally drive a reluctance motor and launch a packaged solution for a wide range of industrial applications on a global scale.

Contact us

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