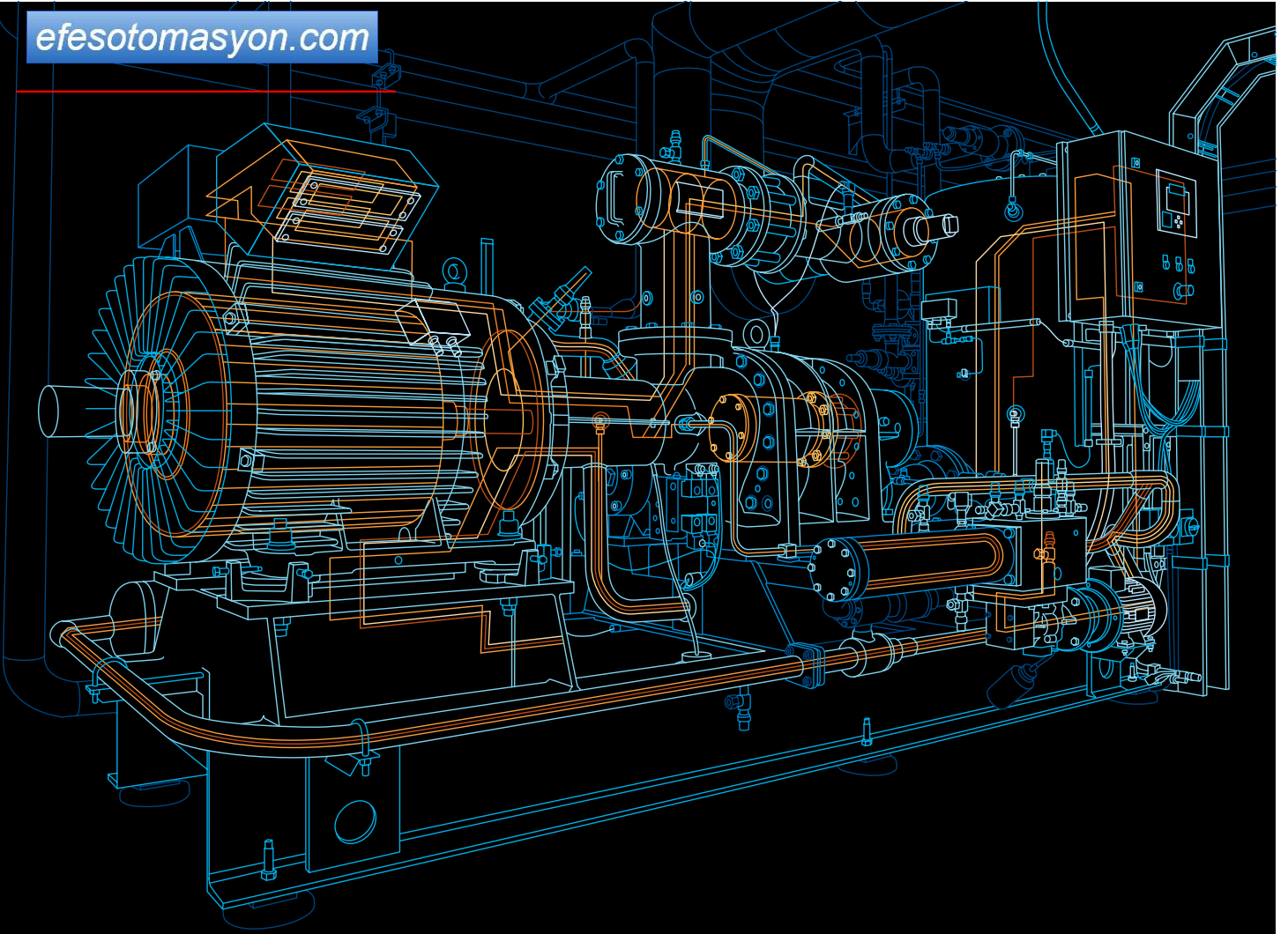


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Brochure

# Products for compressor applications

## Powerful, reliable, efficient solutions

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Power and productivity  
for a better world™



# A powerful partner

## ABB is a powerful partner in compressor applications, offering a broad range of products and solutions that are designed to deliver value over their entire lifetime.



### Technology leader with global reach

As an acknowledged technology leader, ABB has the resources to help customers meet even the greatest challenges. We can leverage our R&D expertise and experience to tailor products to exactly match the needs of compressor applications, and work together with customers to develop entirely new solutions. Our in-depth understanding of different end-user industries and industrial processes gives us the flexibility to implement projects of all types – from standard product supply to complex global projects.

We are a truly global player. Global products and solutions ensure that the best materials and components, together with the latest technical innovations, are used at all ABB manufacturing plants. With a global manufacturing footprint, we can supply identical products in all markets around the world. Our experience in global business models enables us to support customers' businesses wherever they are located. We have a solid track record in working with frame agreements and other general sourcing models on very large projects, and we combine global reach with strong local presence to provide effective support in all significant markets.

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## Reference cases

### The largest motors in the world

A large air separation plant in the Middle East uses four 11 kV 1500 rpm synchronous motors supplied by ABB. Two of the motors are rated at 59 100 kW, making them the largest 4-pole synchronous motors in the world at present. These motors each drive a compressor supplying air at a rate of approx. 500 000 m<sup>3</sup>/h to the two parallel air separation units. The other two motors, rated at 39 300 kW, drive compressors supplying nitrogen for injection into the onshore condensate field. The two air separation units have a total nitrogen capacity of 670 000 m<sup>3</sup>/h.

Air separation is a very energy intensive process and electricity is by far the largest cost factor in production. High efficiency motors and compressors are therefore used in the process.

ABB's scope of supply also included two medium voltage drives and four converter transformers. ABB won this contract on the basis of its references, extensive experience and technical competence with large motors.



### World-class products backed by innovative services

We supply a wide range of motors, drives, switchgear and control products for compressor applications. In addition to high quality and reliability, ABB products also deliver outstanding efficiency, helping to save energy and reduce CO<sub>2</sub> emissions. They meet the relevant standards, and we constantly monitor standards and official requirements around the world to ensure we can stay ahead of new developments. Our large installed base and extensive experience give us the expertise to assist customers with issues like process optimization, efficiency maximization, effective use of variable speed drives (VSD), and many more.

ABB's back-up services take the customer relationship to a new level. Innovative eBusiness systems mean that routine tasks such as checking stock availability, ordering, tracking order status, and accessing documentation can all be done quickly and easily online. Advanced logistics solutions ensure high availability and fast delivery of products, accessories and spare parts. Our extensive service organization enables us to provide lifetime support for our products no matter where in the world the customer is located.



### Saving energy with VSD controlled compressors

A variable speed AC drive is one of the most effective ways of saving energy, frequently providing energy savings of 30 percent or more in compressor applications. Atlas Copco in Belgium replaced a 275 kW fixed speed compressor with a 315 kW variable speed unit. Testing with three different load profiles showed energy savings of 18 - 25 percent were realized, reducing energy costs by more than €15 200 per year and providing a payback of just three years.

The major advantage of VSD control is that compressed air production precisely follows variations in demand. Direct

energy savings of 15 - 35% can be achieved through lower consumption at partial loads. Accurate control also means that lower discharge pressures can be used. Reducing system pressure from 7 to 6 bar, for example, reduces energy consumption by 7%. Other benefits include stable system pressure through rapid reaction to pressure changes, typically within 0.1 bar; smooth starting – which means no peak current penalties, less stress on mechanical parts and unlimited start-ups; and a fixed power factor.

# Wide range of products

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### Low voltage motors

ABB offers a total portfolio of standard low voltage motors, arranged in two product ranges, ensuring that the right motor can be found for any type of compressor. Complementing the portfolio of standard motors, ABB also offers a full range of hazardous area motors.

Process performance motors deliver the highest efficiency and reliability, thus ensuring the best value in terms of lifetime costs. Our extensive experience and close cooperation with global compressor manufacturers ensure that these products incorporate the features needed in compressor applications, resulting in dependable, fit-to-purpose motors. The cast iron motors are available in IEC frame sizes 71 - 450.

Industrial performance motors offer high efficiency and a selection of frame materials. They provide all the options and variants needed by compressor manufacturers and are available with short lead times. These motors are supplied in IEC frame sizes 63 - 400.

### High voltage motors

ABB supplies a complete range of high voltage synchronous and induction motors for compressors. High efficiency, reliability, robust construction and VSD compatibility ensure that these motors provide an ideal match for even the most demanding compressor application and offer considerable savings over their entire lifetime. The high degree of standardization and use of modular platforms mean that the motors can be perfectly engineered according to the individual customer's requirements for application areas that include special and hazardous environments.

Induction motors, up to 18 000 kW, are available in modular and cast iron construction. Synchronous motors are available up to 60 000 kW.





### Low voltage drives

ABB supplies an extensive portfolio of low voltage AC and DC variable speed drives, the AC drives covering a power range of 0.18 - 5 600 kW. Variable speed drives provide significant energy savings in compressor applications, when compared with fixed speed motors and conventional pressure control methods. It has been calculated that in 2008 the worldwide installed base of ABB AC drives helped to reduce electricity consumption by some 170 TWh. If this electricity had been generated with fossil fuels, it would have resulted in the production of around 140 million tonnes of CO<sub>2</sub>. This is equivalent to the annual CO<sub>2</sub> emissions of over 35 million cars.

When used with air compressors, low voltage drives reduce energy consumption, air consumption and leakage, and provide improved pressure control. Refrigeration compressors used with drives can achieve high total efficiency, even at reduced load, and energy efficient capacity control. In refrigeration screw compressors, smooth capacity control enables precise regulation of the refrigeration temperature.

### Medium voltage drives

ABB medium voltage drives provide powerful and accurate control of compressor applications. They are available in the power range 315 kW - 100 MW and can be used with induction, synchronous and permanent magnet motors. Compared to mechanical control methods, ABB's electric variable speed drives offer many advantages, including increased availability, better control, and improvements in overall energy efficiency, operational flexibility and maintainability.

ABB also supplies high speed VSDs for compressors. The combination of a high speed VSD and motor means that the motor can be coupled direct to the compressor without the need for a gearbox. This compact solution reduces maintenance requirements and noise levels and provides considerably higher availability than a conventional solution using a step-up gearbox.





### Low voltage breakers and switches

ABB's circuit breakers provide the optimal solution for motor protection in the range 0.37 kW - 355 kW. These very compact units are particularly suitable in applications where information on the status of the breaker or other data has to be transmitted remotely.

In fusible electrification systems, switch fuses provide superior short circuit protection up to 1250 A for voltages up to 690 V. Switch disconnectors are available up to 3150 A to ensure safe operation, protecting both people and equipment, and eliminating the risk of accidents. Enclosed switches in plastic and metal can be used for quick and safe local isolation of equipment during maintenance and repair.

Breakers and switches are widely used for protection of the main power circuits and in motor starter applications for switching and isolating. Together with contactors, thermal overload relays and fuselinks they also provide protection against overloads and short circuits.

### Instrumentation

Getting the best levels of efficiency and performance from a production process calls for reliable, accurate instrumentation. Equally important is access to a support network that can provide assistance throughout all stages of the process, regardless of where the customer is located. ABB Instrumentation delivers not only high quality device solutions but also enhanced levels of customer care.

ABB's technologically superior instrumentation products are designed to reduce operational costs. Our innovative products, deployed with the customer's choice of fieldbus technology, monitor real-time values, identify potential problems, and proactively notify support before productivity is affected. ABB automated monitoring and reporting products are straightforward and accurate, so critical information is always available.



### Low voltage control products

Efficiency and performance are the result of accurate and advanced control. ABB supplies a full range of low voltage control products to safely start, protect and control compressors. Our range includes contactors, manual and universal motor starters, soft starters, electronic components and relays, as well as a wide selection of connection products and PLCs. Starting options are direct-on-line, star delta and soft starting, and available protection modes include selectable overload protection class, underload detection, phase loss, and reversal protection. Key benefits include torque control during starting, which increases machine service life and reduces downtime.

ABB control products are designed to enable interoperability, simplify installation and improve operation and service by offering reliable compressor control solutions.

ABB Instrumentation Services delivers the knowledge and global experience required to keep customers' assets operating at maximum reliability and accuracy. We provide a full scope of services, from start-up and commissioning through lifecycle support, and our global strength means we can deliver support wherever and whenever it is needed.



# Contact us

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