Power transformers

Industrial transformers
Power and productivity for a better world

Power and productivity
for a better world™

Industrial transformers
Meeting the demands of the toughest applications

Robust and reliable work-horses of the process industry

Industrial transformers are key elements in the processes into which they are integrated. Reliability is crucial to ensure uninterrupted power supply to motors, furnaces and smelters used in a wide variety of applications including primary aluminum and steel plants, pump storage power plants and rail networks.

Why industrial transformers?

Industrial transformers lower the voltage from the network to the application level so that currents can be maximized. ABB's industrial transformer range includes regulating and rectifier transformers, AC arc furnace transformers, series reactors for AC arc furnaces, DC arc furnace transformers and large drive/converter transformers.

Robust design

To reliably deliver the necessary power, industrial transformers must feature a robust design and construction. They are the work-horses of numerous industrial processes, whose long-term continuous and trouble-free operation is essential to the efficient and profitable production of metals such as steel and aluminum or the compression of natural gas.

Design skills paired with process insight

ABB has more than 100 years of experience in the design and manufacture of power transformers. As a supplier of motors, generators and process-related systems and equipment, ABB has the process skills necessary to deliver perfectly tailored solutions, regardless of type of industry. Each industrial transformer is the result of close cooperation with partners inside and outside the ABB Group.

Quality throughout the supply chain

Today's business demands mean that throughout the whole life cycle of an industrial transformer there is little margin for error in any of the steps from conception, approval, delivery, commissioning or operation. It is therefore key to the wider process that your partners and their products or services can be relied on.

High power industrial transformers need to meet the demands of the toughest applications, which are by definition "out of the ordinary".

Main characteristics:
- Wide low voltage regulating range
- LV current to hundreds of kA
- Ratings to over 400 MVA
- Primary voltages up to 400 kV

Operating conditions:
- High intermittent operating cycles
- Operation close to short circuit conditions
- Frequently unbalanced loads
- Over-voltage stresses and harmonics
- Tough environmental conditions

Quality through control and customer interaction

Industrial transformers are customized to each specific application. An understanding of both the product and the system conditions is therefore essential in determining the optimum and most economical concept. The optimum solution is normally best found through an iterative process between ABB and its customers.

Customized to specification

Each ABB transformer is fully compliant with customer specifications and developed together with ABB's system specialists to ensure each design is tailored to individual application requirements including the core, winding and insulation design, tank, bushings, coolers, tap changers and reactors.

Improved system operating performance and efficiency

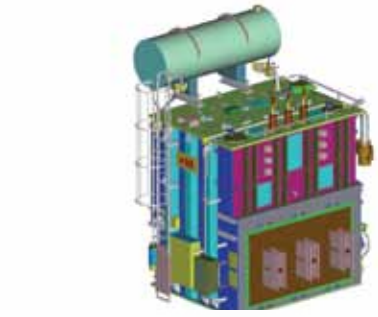
ABB industrial transformers allow you to control the power flow in the application across a wide operating range, via either on-load or off-load regulation, resulting in process optimization.

Project management

Only with the best project management and documentation systems can a complex project be realized on time. Likewise, it is only with the highest attention to detail that a complex product such as an industrial transformer can be designed, produced and delivered on time and in a manner that will ensure many years of trouble-free service. With ABB, project management starts right from the tender stage and continues beyond the equipment's end of life.

Testing

Each industrial transformer is rigorously tested before leaving the factory. This is in addition to the extensive checks that are carried out throughout the design and production processes. Routine tests are carried out according to IEC and any applicable local standards, such as ANSI or GOST. It is also possible to arrange combined system tests. ABB is furthermore the world leader in both the number of short circuit tests carried out by independent test laboratories and our first time pass rate.



TrafoStar
Ensuring excellent performance in all business processes

ABB's TrafoStar design and manufacturing platform ensures efficient and reliable long-term operation. Its common global design rules provide a structured methodology applicable in all phases of power transformer production – quotation, electrical and mechanical design, manufacturing and testing.

A comprehensive quality management system – including checklists, control points, design reviews and documentation – addresses quality in all business processes.

Efficiency
Each industrial transformer builds on ABB's global TrafoStar design and manufacturing platform, resulting in a low-loss and low-noise transformer design. State of the art materials together with core and coil arrangements, an optimized tank and bus bar design support low electrical losses and optimized impedance.

Reliability
Experience from hundreds of installations and tests results in extremely robust designs that provide outstanding short-circuit strength. Industrial transformer experience from many different factories and legacy brands are combined into one set of design tools that are implemented across local focus factories. This results in a team of comprehensive expertise and supports designs optimized for reliability.

Safety
Transformer designs are thoroughly checked and proven via best in class 2D and 3D finite element modeling tools to ensure that all potential risk areas, such as transients, inrush, uneven current distribution or hot spots, are identified and controlled. These tools are themselves continually validated by extensive in-house and third party testing, safeguarding your investment and process uptime.

On-time delivery
ABB is committed to delivering on time, every time. Due to modularized design, manufacturing and assembly, high in-house content, first class sub-suppliers and excellent quality control practices, you can confidently plan your project based on an on-time delivery from ABB.

Five product categories that cover the toughest industrial process requirements

ABB offers a comprehensive range of industrial transformers suitable for many different industry applications. With over 600 units delivered in the last 20 years, ratings over 400 MVA and primary voltages up to 400 kV, ABB has an unrivalled track record as the world's leading supplier of industrial transformers.

Rectifier transformers

Rectifier transformers are used for various electrolysis applications such as aluminum, other metals and chlorine. They are combined with a diode or thyristor rectifier. Applications range from large aluminum electrolysis to medium size operations. The transformers may have a built-in or separate voltage regulation unit.

- For applications in excess of 2000 VDC (>100 kA)
- Installed base of over 20,000 MVA

AC arc furnace transformers

ABB produces transformers for all furnace applications, including long-arc (steel) and short-arc (ferroalloy) operation. A robust design guarantees mechanical strength for steel furnace operation and temperature control for continuous high loads in ferroalloy operation.

- For applications in excess of 1500 V (>160 kA)
- Installed base of over 10,000 MVA

Series reactors for AC arc furnaces

Most AC steel furnaces require a series reactor in the primary. For long-arc steel furnace operation, additional reactance is normally required to stabilize the arc and optimize the operation. The series reactor is either built into the furnace transformer tank itself or supplied separately.

- For applications in excess of 60 MVA
- Self standing or in-built options

DC arc furnace transformers

DC arc furnace transformers are mainly used for steel production. Transformers for DC furnace operation normally come in a transformer and rectifier package. The full package can be manufactured and supplied by ABB.

- For applications in excess of 1200 V (>100kA)
- Installed base of over 4000 MVA

Large drive/converter transformers

Used in drive systems e.g. for pumping stations, LNG compressors or traction feeding. The transformers are combined with a thyristor rectifier for variable speed drive (VSD) systems or frequency conversion.

- For applications in excess of 155 MVA
- Voltages up to 400 kV

Full support from transport to training

ABB's transformer services ensure that your transformers operate at optimal performance throughout their lifetime. Our services range from transportation and basic maintenance to advanced diagnostic assessments and onsite repairs.

Service

Each power transformer comes with a technical guarantee and full backup, including field support and global after-sales services delivered by local branch offices, agencies and representatives throughout the world. Diagnostic assessment, onsite repairs, upgrades and spare parts deliveries are available worldwide.

Transportation

Reliable transportation is key to successful power transformer installation. Moving an object the size and weight of a large transformer requires planning, know-how and a global network of contacts. ABB has long experience in delivering transformers by rail, road and sea worldwide. Our skilled staff will ensure a fast and efficient transport process.

Installation

ABB engineers can be on site to support installation and startup. They will prepare the transformer by reassembling all parts dismantled for transit, refill it with oil and run the necessary tests to ensure trouble-free operation. Customers can choose between a supervisory or full-installation agreement. As far as possible, the engineers assigned will have local language skills.

Training

The customer's local operations and service personnel can be trained during installation and commissioning on site. Comprehensive training programs are available – contact your local ABB representative for more information.

Contact us

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