



High Power Rectifiers for the Chlor-Alkali industry

The best solution for total availability
and efficiency

Ensuring your process operating under all conditions

Continuous operation is crucial for a successfully operating chlor-alkali plant. Then, not only is the production output maximized, but the overall capital cost is minimized and the return on investment is clearly in the owner's favor.

That is why ABB offers integrated systems of DC power supplies for electrochemical processes that provide unrivalled availability and uptime in combination with one of the lowest market's life cycle cost.

DC power from ABB – equipment you can trust

The chlor-alkali industry is characterized by an aggressive and corrosive environment that is very threatening for electrical equipment. Compromises on the ruggedness and reliability of the equipment are not permitted.

Although the investment for the DC power supply is minor compared to the total plant cost, a loss of power results in tremendous loss in production.

As a leading worldwide supplier of rectifiers, ABB has the experience and technological expertise to fulfill your demanding requirements.

Attention to detail through many years of experience has given us deep knowledge of all components of a DC power supply for a chlor-alkali system. Our solutions are based on a total quality program, perfectly fitting a specific plant.

Total system design

The focus of our expertise and experience is on designing complete rectifier systems. This means that our knowledge goes far beyond the rectifier itself. In fact, we also supply transformers, filter banks, busbars, DC isolators, switchgear and any other electrical equipment you may require. We take care of all aspects of planning, installation and successful start-up of the rectifier system based on the knowledge acquired by executing hundreds of projects.



Your No. 1 choice for a total system approach

Every plant is different, and so are our customer's needs when it comes to DC power sources. We design your DC power supply and always provide you a tailor-made solution ranging from optimization of rectifier system configuration to total plant efficiency and power quality demands.

We offer market leading engineering capabilities for the chlor-alkali industry based on customer specific studies:

- Network system and power quality studies
- Filter and power factor compensation engineering
- Feasibility studies
- Time-varying magnetic field studies

Lowest cost of ownership

In an economic calculation of the operating cost of a rectifier system, various direct and indirect costs should be considered throughout the system's entire life. Savings on operational and energy cost will compensate for the initial investment.

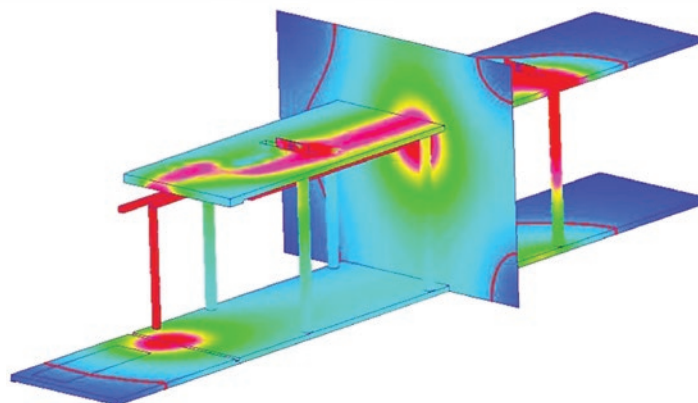
With ABB rectifiers you achieve lowest total cost of ownership and boost your production through:

- Maximized availability
- Maximized electrical efficiency
- Minimized maintenance
- Highest personnel safety
- Extended lifetime
- Shortest installation and commissioning

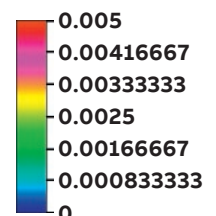
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01 Rectifier unit
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02 Time-varying magnetic field simulation



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Shaded Plot
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High performance equipment – the base for your productivity

Higher availability with fewer components

ABB rectifiers have established themselves as the most effective in the electrochemical industry. The state-of-the-art design achieves unmatched levels of power density and reliability, characterized by a low number of components and water-cooled aluminum heat sink profiles. An ABB rectifier's modularity and simplicity makes it highly scalable, with high availability and low maintenance. The modules typically comprise a rectifier transformer, rectifier, a cooling unit and controls, combined into a complete, specific solution resulting in the optimum DC power supply for your application.

Not just a component, but part of your process

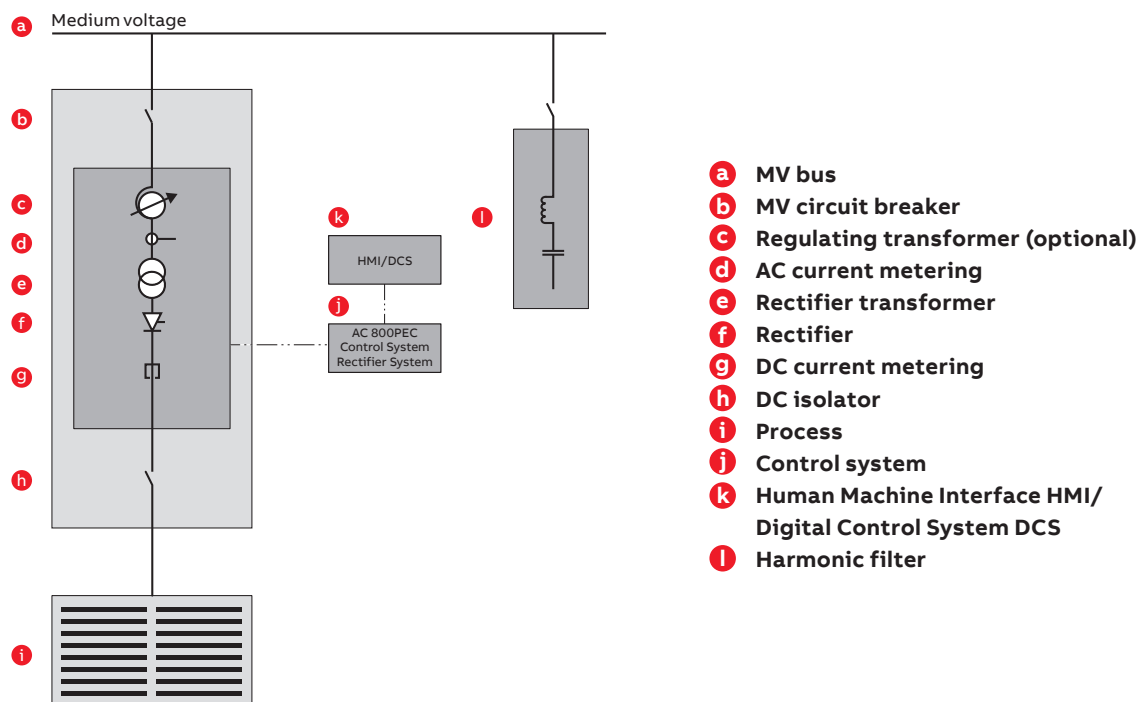
Through our system design approach we ensure that the specification of all rectifier system components matches the harshest operating conditions, taking into account all possible load cases. In every case, we take your process parameters into our layout design in order to achieve the most efficient and service-friendly solution. Such attention to detail is just an example how ABB looks beyond the product to the system solution.

Maximum reliability with quality material

ABB's rectifiers are built with high-quality material (high tracking index and pollution class) to withstand hazardous operational conditions. No matter how rough the operational environment is, our equipment and our design guarantee high reliability during product lifetime thanks to:

- Individual semiconductor temperature monitoring for effective hotspot detection
- Optical thyristor firing
- Stainless steel pipes in the cooling circuits
- Robust steel ventilator
- Industrial high-grade type hoses
- Double insulation concept for maximum safety
- Selection of components/wiring based on high tracking index (CTI>400) and pollution class 4

Typical rectifier system single-line diagram for the chemical industrie





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Typical 12 pulse MCR
rectifier for chemical
installations

Smart control for immunity to interference

High-performance control for the toughest conditions

ABB's high-speed AC 800PEC controller provides high processing power with very short cycle times. It has been specially designed for power electronic applications in harsh industrial environments.

The AC 800PEC has been designed to provide IEC standard EMI immunity. All peripheral devices including the thyristors' firing boards are linked via fiber optic connections directly with the main CPU.

System communication is via fiber optic links only and is immune to electromagnetic interference even in high magnetic field areas.

Modern AC 800PEC control systems provide state-of-the-art remote diagnostics to ensure the fastest possible service and support response.

Extra benefits of a high-speed controller

No undervoltage shut-down

The intelligent control logic avoids a primary undervoltage shut-down by a ride through of several hundred milliseconds, basing its control on a Phase Locked Loop (PLL).

This increases the uptime of the system in case of a primary undervoltage and avoids the costly shut-downs that can result from a drop in incoming supply voltage, when conventional control systems are employed.

Efficient maintenance with extensive predictive monitoring

The AC 800PEC provides a number of predictive diagnostic functions like trending, transient recorder, remote diagnostics and full text alarm messages, which prevent unscheduled shut-downs and allow more efficient production and maintenance planning.

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AC 800PEC



Engineered to bring your plant to excellence

Our keynote – never compromising on safety

We never design to the limits at the expense of quality. No matter how demanding your project requirements are, you can be sure our solution will provide continuous performance and maximum safety to protect personnel and equipment and minimize exposure to risk.

Our system can be designed according to the latest EC directives and IEC standards to enhance maintenance and operation personnel safety.

Continuous improvements

ABB understands your process and guarantees continuous technical development along with innovations in electrochemical industries. Our regular participation in relevant committees and technical forums keeps us up to date with the latest industry trends.

As part of our commitment to offering our customers total service, we provide support and advice on meeting the ICNIRP recommendations and any national standards on EMF impact reduction and protection. Based on evaluation, calculation models and computer simulations we recommend measures for:

- Reducing the DC ripple in rectifiers with a network reaction of 12 pulses or higher
- Achieving mutual field compensation by optimizing the plant layout – especially the size and location of DC busbars

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“When we decided to replace the electrolyzers in our chlor-alkali facility as part of a modernization project, we also opted to continue with ABB rectifiers and not replace them with an alternative competitor brand. We have the utmost confidence in ABB’s superior technology and also the care and precision of its commissioning team.

After eleven years of experience with ABB rectifiers in the chemicals industry, I can confirm that our strategy was definitely correct. ABB produces reliable, efficient and innovative equipment and is always very keen to meet our requirements fully.”

Ozden S. Gurpinar, Electrical & Inst. Dept. Manager, Akkim Chemicals, Turkey



Life cycle service – for customer satisfaction

A key objective is to maximize your process uptime by providing low-cost guarantees of an extended service life for all ABB products.

- Throughout the entire lifetime of a product, ABB will provide training and technical support and arrange service contracts – all backed by a world-class global sales and service network.
- ABB's preventive maintenance programs increase active life, minimize replacement costs and lower investment. At the same time, the right service plan will extend the service life of ABB equipment by several years.
- Thanks to a long life, low maintenance costs and very low spare parts consumption, ABB equipment will soon pay for itself. An extended service life is also achieved through control add-ons and power components that operate well below their design limits.

A properly maintained ABB rectifier system can last more than 25 years.

A local presence – worldwide

With offices in around 100 countries, ABB is well placed to offer the best technical advice and local support around the clock.

ABB's global presence is built on strong local companies. We offer local sourcing while drawing on our worldwide experience. By combining the experience and know-how gained in both local and global markets, we ensure that our customers will get the most out of our product solutions.

- We guarantee fast and flexible support with our remote access platform via the 24/7 support line on a global level.
- We offer condition monitoring service across the whole system starting from HV switchgear downstream to the DC output or process.

For further details about all our services, please contact your nearest ABB office or visit us at www.abb.com/rectifiers.





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