

Life cycle services for automation products

Profile

ABB's Automation Products business serves customers with energy efficient and reliable products, services and solutions related to low voltage products and switchgear, breakers and switches, drives and power electronics, motors and generators as well as instrumentation, all with the aim of improving the customer's productivity.

With over 170,000 products in its portfolio and with more than one million products being shipped daily to end customers and channel partners, there comes a significant responsibility: ensuring that every one of ABB's customers reach their full potential in productivity and energy efficiency.

With a worldwide installed base of over \$70 billion, spanning a wide range of industry and utility operations, plus commercial and residential buildings, this demands a formidable service and support infrastructure.

Automation Products has more than 3,000 employees dedicated to service around the world. This organization is strengthened by more than 400 companies that are authorized to service ABB products.

ABB's Automation Products business has an installed base of over \$70 billion covering all industries



Profile

Supporting the goals of industry

All industries face a common goal: to maximize their production output at the lowest possible cost, while maintaining the highest quality end products. On the road to achieving this goal, businesses face:

- Escalating operational and capital expenditure associated with running a plant or process
- Rising energy prices
- Pressures to improve productivity
- Stricter environmental and safety regulations

One of Automation Products' key objectives is to maximize the uptime of its customer's processes by ensuring the optimum lifetime of all ABB products in a predictable, safe and economical manner.

Among the benefits of using ABB services and support are lower operational and life cycle costs, improved productivity, reduced environmental impact and enhanced safety.

Lower operational and life cycle costs

At each stage of the asset life cycle, ABB can help optimize operational expenses.

During the pre-purchase stage, sound technical advice can ensure that the correct product is selected and dimensioned to bring maximum efficiency and performance to a process and therefore lower running costs.

ABB's preventive maintenance, upgrade and retrofit solutions have a significant impact on minimizing production downtime, lowering operational costs and extending the product life cycle.

Improved productivity

Supporting customers to keep their plant running is the number one priority for the ABB services team. For example, ABB's remote support and diagnostics capabilities provide expert help at any time and any location. A structured maintenance plan built around product specific maintenance schedules is essential in avoiding any risk of plant or process stoppage.

One of the most efficient ways to ensure high productivity and process uptime is to rely on a service contract which covers a combination of services such as training, technical support, maintenance and ensuring the availability of spare parts.



Life cycle management for maximum return on investment

ABB's Automation Products business follows two main structures to ensure its customer's installations remain healthy:

1. ABB's product life cycle management model assures availability of services and support throughout the life cycle and a smooth transition to new technology at the end of the life cycle.
2. ABB's service offering follows a logical flow that spans the entire asset life cycle, from the moment a customer makes the first enquiry through to disposal and recycling of the product.

At the heart of ABB's services is its product life cycle management model. All services and support available for ABB products are planned according to this model.

Product specific life cycle plans are available for customers to help with maintenance planning and when deciding about upgrades, retrofits and replacements.

Product life cycle management model



The life cycle management model divides a product's life cycle into four phases: active, classic, limited and obsolete. Each phase has different implications for the end user in terms of services and support provided.

In the 'active' phase the end user benefits from warranty options and a full range of life cycle services, spare parts and maintenance materials. This phase ends when the volume production of a particular product ends and the 'classic' phase starts. In addition to offerings available in 'active' phase, end users may migrate to new technology by using upgrade and retrofit solutions providing improved performance and extension of the life cycle.

After the 'classic' phase products enter the 'limited' phase and end users are recommended to start planning a transfer to new technology before product support ceases.

Spare part services continue as long as components and materials are available, and throughout the course of time the use of reconditioned parts increases.

A product is transferred to the 'obsolete' phase when it is no longer possible to provide life cycle services within reasonable cost, or when ABB can no longer support the product technically, or the old technology is no longer available.

Benefits of product life cycle management

Product life cycle management maximizes the value of equipment and maintenance investments by:

- ensuring spare part and competence availability throughout the life cycle
- enabling efficient product support & maintenance for improved reliability

- adding functionality to the initial product by following the upgrade path
- providing a smooth transition to new technology at the end of a product's life cycle
- helping the end user to decide when an upgrade, retrofit or replacement is required

Life cycle service and support



The services offered by ABB's Automation Products span the entire asset lifetime, from the moment a customer makes the first enquiry to disposal and recycling of the product. Throughout the lifetime of an asset, ABB provides training, technical support and customized contracts. All of this is supported by one of the most extensive global sales and service networks.

Pre-purchase

ABB provides a range of services and support that help guide the customers to the right products for their applications.

Order and delivery

Orders can be placed through any ABB office or through ABB's channel partners. In some countries, ABB also offers a global on-line ordering and tracking system.

ABB's sales and service network offers timely deliveries including express delivery.

Installation and commissioning

While many customers have the resource to undertake installation and commissioning on their own, ABB and its

channel partners offer professional installation and start up services.

Operation and maintenance

From maintenance assessments, preventive maintenance and reconditioning to spare parts and repairs on-site or within its workshops, ABB has all the options covered to keep its customer's processes operational.

Upgrade and retrofit

ABB products can often be upgraded to the latest software or hardware to improve the performance of the application. Existing processes can be economically modernized by retrofitting the latest technology.

Replacement and recycling

ABB can advise on the best replacement products while ensuring that the products are disposed of in a way that meets all local environmental regulations.

Services portfolio

	Pre purchase			Installation & commissioning				Post installation						
	Selection and dimensioning	Life cycle audit	Energy audit	Installation	Installation support	Commissioning	Start up	e-learning	Class room training	On-site training	Technical support	Preventive maintenance	Preventive maintenance	Record keeping
Instrumentation														
Valve actuators and positioners	●	●		●	●	●	●		●	●	●	●		●
Analytical instruments	●	●		●	●	●	●		●	●	●	●	●	●
Flow measurement	●	●		●	●	●	●		●	●	●	●		●
Pressure measurement	●	●		●	●	●	●		●	●	●	●		●
Recorders and controllers	●	●		●	●	●	●		●	●	●	●	●	●
Temperature measurement products	●	●		●	●	●	●		●	●	●	●		●
Low voltage products and systems														
Circuit breakers	●	●				●	●	●	●	●	●	●		●
PLC and automation	●		●		●	●	●	●	●	●	●			●
Soft starters	●				●			●	●	●	●	●		●
Low voltage switchgear MCC	●	●		●	●	●	●	●	●	●	●	●	●	●
Low voltage switchgear EDB	●	●		●	●	●	●	●	●	●	●	●	●	●
Low voltage intelligent switchgear	●	●		●	●	●	●	●	●	●	●	●	●	●
Drives and power electronics														
Component drives	●	●		●	●		●	●		●				●
Machinery drives	●	●		●	●	●	●	●	●	●	●	●	●	●
Standard drives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Industrial drives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Medium voltage drives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wind turbine converters	●						●	●	●	●	●	●	●	●
Solar inverters	●						●	●	●	●	●	●	●	●
Power converters	●	●		●	●	●	●	●	●	●	●	●	●	●
Traction converters	●					●	●	●	●	●	●	●	●	●
Power quality products	●			●	●	●	●	●	●	●	●	●	●	●
High power rectifiers	●	●		●	●	●	●	●	●	●	●	●	●	●
Excitation systems	●	●		●	●	●	●	●	●	●	●	●	●	●
Motors and generators														
DC motors	●		●	●	●	●	●	●	●	●	●	●		●
High voltage induction motors	●		●	●	●	●	●	●	●	●	●	●	●	●
Low voltage motors	●		●	●	●	●	●	●	●	●	●	●	●	●
Servomotors	●		●	●	●	●	●	●	●	●	●	▲		●
Synchronous motors	●		●	●	●	●	●	●	●	●	●	●	●	●
Traction motors									●	●			●	
Synchronous generators	●			●	●	●	●	●	●	●	●	●	●	●
Wind turbine generators	●			●	●	●	●	●	●	●	●	●	●	●

● = service available
▲ = service under development

Please note: availability of services may vary from one country to another and certain services may not apply to all the product lines of a particular product group. More detailed information, including any new ABB services, is available by contacting your local ABB organisation direct - contact details can be found at www.abb.com/service

Pre-purchase

Selection and dimensioning

ABB offers the support and tools to help the customer select the right product for their application. Product guide and selection tools are available through www.abb.com/productguide

Life cycle audit

A life cycle audit will highlight the general condition of your equipment and its life cycle status. For all stages in the life cycle, ABB can offer appropriate maintenance paths to upgrade the reliability of the equipment. The audit will also identify obsolescence issues and offer appropriate migration paths and upgrades to extend the equipment's operating life.

Energy audit

Some products within ABB's portfolio – most notably variable speed drives, motors and generators – have a direct impact on the energy saving potential of a plant or process, but considerable savings can be made in buildings, too, by using automation products. An energy audit culminates in the final report. Here, ABB engineers gather all available details on the existing configuration, the solutions that will lead to improved energy efficiency, potential savings and the time periods for return on investment.

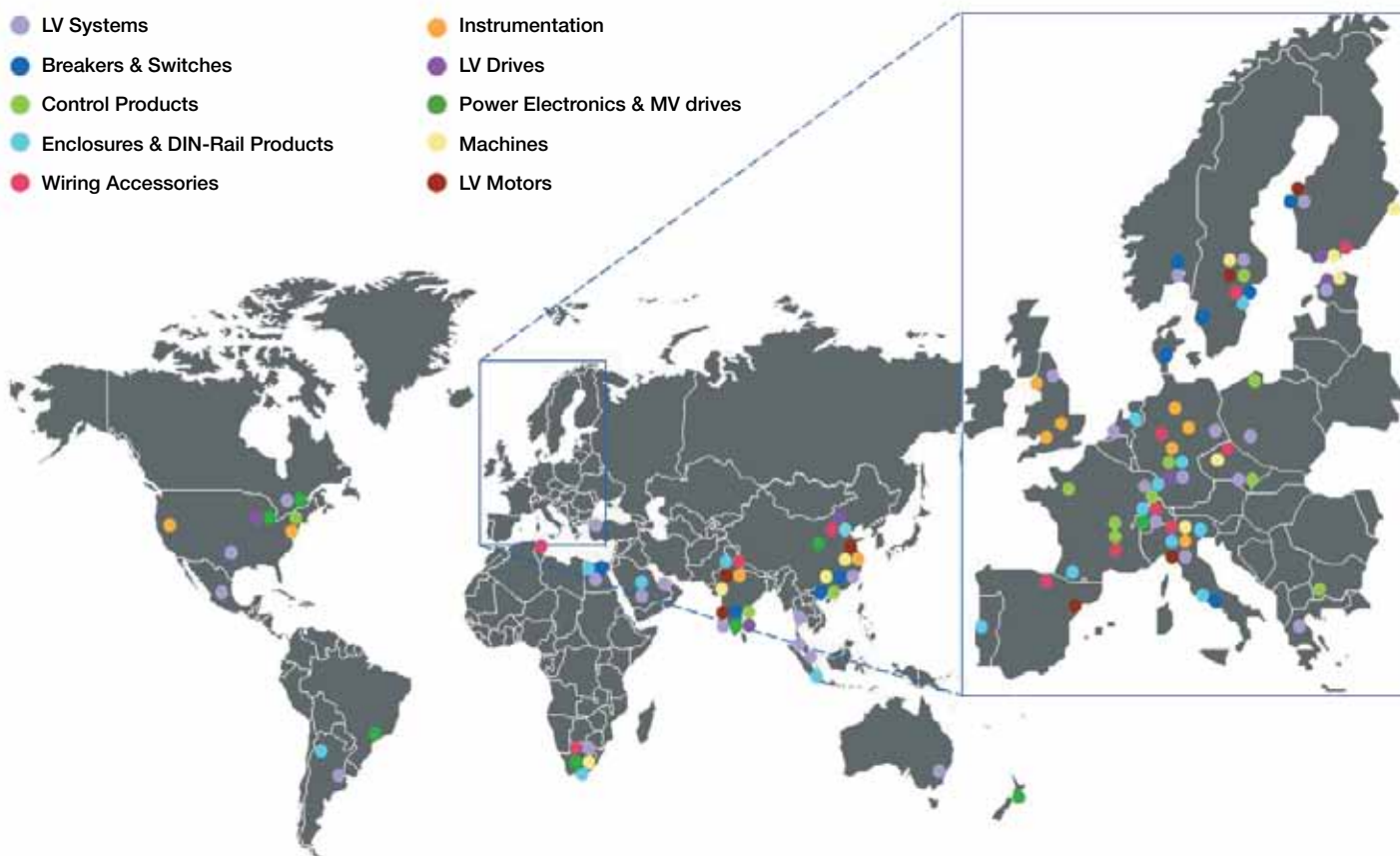


Order and delivery

Automation products

With more than 100 manufacturing sites in 50 countries (see image below), the Automation Products Division of ABB is able to deliver one million products per day through sales activities in more than 100 countries. ABB often gets the reaction from its customers, "Do you really do all that?",

when they take a first glance at ABB's Automation Products catalog. With a range of more than 170,000 products, ABB supplies just about every type of electronic equipment; from standard components to the latest control technology, to meet all customer's needs, whether a standalone product or a completely integrated system.



ABB's Automation Products manufacturing sites.

Order and delivery

Through its global logistics network, ABB offers genuine factory certified spare parts and related services tailored to customer's needs. A wide range of parts is available within a short time, often in 24 hours direct to site. ABB spare parts and services can be purchased from more than 1400 companies located throughout the world and is able to serve customers locally, often in their own language. These companies include ABB's own offices and authorized channel partners.

In many countries, ABB and its channel partners, stock products and spare parts locally, providing high availability and, often, same day delivery. To minimize its customer's costly downtime, ABB's logistics network, in many countries, operates 24 hours a day, seven days a week, using air freight and express courier services.



Installation and commissioning

All ABB's Automation Products are designed with easy installation and commissioning in mind. A range of features unique to the broad ABB product range, from easy access wiring terminals, through to bookshelf design and intuitive control panels, all contribute to saving installation and commissioning time and cost.

ABB's technical manuals are comprehensive, including all the details needed for easy installation and commissioning.

Installation support

Before and during the installation, accurate advice and timely support are available from ABB and its channel partners.

Commissioning

Without proper commissioning, no amount of maintenance will achieve the desired performance. ABB's expert engineers can help ensure that products are correctly commissioned and achieve the operating parameters for which they are designed.

Start up

For fast and efficient product start up and configuration, ABB offers its professional start up service. ABB certified engineers adjust the specific product parameters to meet the precise demands of the application.

All start up information with process parameters can be saved, should the engineer need to recall any information at a later date.



Operation and maintenance

Classroom training

Formal training courses are provided by product or service specialists. Training typically consists of theoretical presentations and hands-on exercises.

e-learning

To meet its customer's demand, ABB offers hundreds of course modules available on the internet. The number of e-learning courses is extensive.

On-site training

Versatile training services are also offered by local ABB sales and service companies and their channel partners. Many of the courses can be held at the customer's location.

Benefits of professional training include enhanced personnel and plant safety, reduced downtime, improved productivity and increased employee motivation.

More information about ABB's training centers and the courses can be found from the ABB University at www.abb.com/abbuniversity. Local ABB offices and ABB's channel partners around the globe can provide detailed information on their training and services offering.

Technical support

In most countries, ABB provides 24/365 advanced product and application support, via telephone and email. Should further support be needed, ABB utilizes an escalation process, and the query is elevated throughout ABB to the factory R&D, until the query is answered.

Remote support

In order to expedite the handling of any product or application issue, ABB also provides remote services, such as diagnostics and monitoring. These remote services are provided on a contractual basis and use a secure connection to equipment.



Operation and maintenance

Investing in prevention of failure, rather than living with its consequences, such as loss of production and possible violation of health and safety legislation, is a primary concern for many businesses. Successful prevention of failure can make the difference as to whether or not a company manages to retain its long-term competitiveness.

Maintenance assessment

A maintenance assessment carried out by ABB provides the foundation for developing a long term maintenance and improvement plan for ABB products. The purpose

of the assessment is to define measures to be taken for lowering operational costs, improving productivity, reducing environmental impact and enhancing safety. This is carried out by checking plans or technical documentation, checking the apparatus wear conditions, anticipating, as much as possible, eventual corrective actions, checking the quantity of available spare parts, their warehousing conditions and suggesting any eventual re-integration. An effective maintenance plan not only helps customers plan and budget maintenance costs but also helps plan for future product upgrades, retrofits and replacements.



Operation and maintenance

Preventive maintenance

A preventive maintenance schedule consists of regular inspections and component replacements according to the product specific maintenance schedule. Maintenance schedules are based on ABB's decades long experience of manufacturing and maintaining its products.

Adopting preventive maintenance schedules reduces the risk of failure and increases the lifetime of the product, thus lowering the overall operational costs. Regular predefined preventive maintenance facilitates budgeting.

On-site preventive maintenance

Preventive maintenance can be carried out on site by certified field service engineers who utilize preventive maintenance kits for performing all scheduled maintenance tasks. Engineers are

factory trained and have the latest maintenance know-how and experience. Preventive maintenance kits contain all the genuine parts defined by a maintenance schedule. They are more economical to purchase compared with purchasing the spare parts separately.

Reconditioning

Reconditioning in ABB authorized service workshops returns the equipment to its original specification. In addition to on-site preventive maintenance service, reconditioning includes full inspection, thorough cleaning and individual component analysis. Components with a considerable risk of failure and those that have already aged according to the product specific maintenance schedule are replaced and then the equipment is rebuilt. The reconditioned equipment undergoes complete testing and is supplied with a warranty.



Operation and maintenance

Workshop repair

ABB authorized service workshops offer a range of repair services by using the latest technology and production equipment in order to ensure that all repair work meets the same high standards used when manufacturing the equipment. Workshop facilities provide capabilities that are not available on-site such as cleaning and drying, Electrostatic Discharge (ESD) protection, winding, painting, calibration and verification and functional and load testing. In case end users want to keep their ABB motors and generators under the manufacturer's original ATEX certificate, they can turn to ABB authorized motor workshops for repairs.

Spare parts

ABB's spare part services aim to provide customers with the right spare part in the right place at the right time. ABB provides genuine spare parts and spare part kits accompanied with the relevant documentation. In addition to new spare parts, ABB offers exchange units

(return of old part required) and reconditioned parts, which are a more economical alternative to new ones.

Other spare parts services:

- Capital spares - Availability of exclusive parts with long delivery time
- Exchange units - Used, reconditioned and factory guaranteed parts, modules or complete units, which are supplied in return for damaged units
- Recommended spare parts - Optimal set of spares to guarantee different levels of the product's availability
- Consumable spares - Supply of spare parts as discrete spares or packaged options like filters and cartridges, recorder pens & charts, pH electrodes and analyzer reagents
- Spare part kits - Used for special cases such as commissioning
- Preventive maintenance kits - contain all the necessary replacement parts for the specific scheduled maintenance.



Operation and maintenance

Calibration

ABB's Instrumentation calibration and certification service can be performed on-site or in one of its calibration workshops. To ensure equipment delivers the best possible accuracy and repeatability in everyday use, ABB uses only certified and fully traceable test equipment.

Service contracts

A service contract is the most efficient way to manage the total life cycle of an asset and to minimize the risk to a plant's operations.

ABB recognizes that specific service requirements are based on the criticality of assets to production, and the level of in-house expertise which is expected to be maintained. Local ABB service contracts can be custom tailored to compliment in-house expertise and provide the additional capabilities needed to maintain site asset performance at the required level.

ABB's experienced service professionals can help identify and implement effective contract programs for operations that can reduce cost and improve uptime by maintaining equipment at peak performance.



Upgrade and retrofit

Upgrades

Product upgrades are designed for improving the performance and extending both the functionality and the lifetime of the product, thereby providing the best possible return on investments.

Upgrade services comprise both hardware and software updates. Advice on upgrade feasibility with detailed instructions is available from ABB sales and service personnel as well as from ABB's channels partners.

Retrofit

Production or process requirements often call for replacing an existing product. Other reasons for product replacement include lack of spare parts and limited services offering.

It is often more economical to modernize the old installation by reusing all relevant parts of the original equipment and purchasing new where necessary.

Retrofitting is typically carried out during planned production shutdowns, without causing extra production downtime.

According to the ABB product life cycle management model (see page 4) it is recommended that a product be modernized or replaced at the end of its life cycle's Classic phase. The aim is to ensure migration to the Active phase of the life cycle.



Replacement and recycling

Replacement

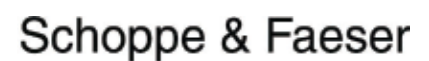
Whenever there is a need to replace a product from ABB or any other manufacturer, ABB offers its customers one of the world's widest portfolio of automation products from low and medium voltage drives, low and high voltage motors and generators and instrumentation to low voltage switchgear and power electronics.

ABB helps select an optimal product replacement with correct features for the application.

Recycling

Depending on the country, ABB aims to remove and dispose of any ABB or other manufacturer's products in line with the environmental regulations enforced within that country. This removes the time and cost burden of end users having to recycle their own equipment.

A collection of Automation Products' legacy brands.

The logo for Bailey, featuring the word "Bailey" in a bold, red, sans-serif font, enclosed within a thin red rectangular border.The logo for Fischer & Porter, consisting of the words "FISCHER & PORTER" in a black, sans-serif font, followed by a large, stylized blue letter "P".The logo for Kent, featuring the word "Kent" in a black, serif font.The logo for Hartmann & Braun, consisting of the words "Hartmann & Braun" in a bold, black, sans-serif font.The logo for Sensycon, featuring a red and blue square icon to the left of the word "SENSYCON" in a bold, black, sans-serif font.The logo for Taylor, featuring the word "Taylor" in a black, cursive script font.The logo for TBI-Bailey, consisting of the words "TBI-Bailey" in a bold, black, sans-serif font.The logo for Ercole Marelli, consisting of the words "ErcoleMarelli" in a bold, black, sans-serif font.The logo for Schoppe & Faeser, consisting of the words "Schoppe & Faeser" in a black, sans-serif font.The logo for Bush Beach Engineering Limited, featuring the words "Bush Beach Engineering" above "Limited", with horizontal lines on either side of "Limited".The logo for TIBB, featuring the word "TIBB" in a large, bold, black, sans-serif font, with "TECNOMASIO ITALIANO" and "BROWN BOVERI MILANO" in smaller text below it.The logo for SACE, consisting of the word "SACE" in a large, bold, black, sans-serif font.

Highlights

Improved energy efficiency with energy auditing services

The world is facing serious energy-related challenges, key issues are how to secure supplies in the face of the fast-growing demand, increasing supply risks, and how to mitigate the environmental harm caused by rising consumption. In 2004 energy produced worldwide was equivalent to about 11.2 billion tons of oil. This includes the energy used to generate more than 17 million megawatt-hours of electricity. Global energy consumption resulted in CO₂ emissions of approximately 26 billion tons.

In 2004, industry accounted for 32% of total end user energy demand and consumed some 40% of the electricity generated. Most energy is used in the cement, chemical, iron and steel industries. Commercial and residential buildings account for some 38% of global end user energy demand, mainly for heating, cooling and powering electric appliances.

In industrial processes, high efficiency motors can reduce energy costs by up to 20% over traditional solutions; when paired with variable speed drives, ie frequency converters, savings can jump to 60%.

In buildings, temperature control can save up to 30%, lighting control up to 50% and building automation up to 60% in energy.

In addition to motors, drives and building automation equipment, ABB offers various products to improve the quality of energy provided by the network. Such products include capacitors, active filtering systems, and low loss switchgear.

ABB's energy auditing service analyzes and optimizes the energy consumption in order to decide how best to apply various solutions to increase energy efficiency in buildings and industrial processes.

Energy auditing service process phases

1. Pre-study: List all equipment that is known to have an effect on energy efficiency at a customer site:
 - identify top sources of energy consumption such as motors and equipment driven by them
 - utilize energy saving tool to pinpoint areas with maximum opportunities
2. Site audit: Conduct an audit at the site to gather more detailed information of the process equipment to enhance pre-study results:
 - perform both visual inspections and measurements
 - make observations not possible at the pre-study phase
 - collect input from operations and maintenance staff
3. Final report: Create a comprehensive report including
 - description of existing configuration with saving potential
 - proposed solutions to improve energy efficiency, the potential savings, and the time periods for return on investment

Benefits:

- Finds ways to improve energy efficiency in industrial processes and in buildings
- Pinpoints areas where tangible energy savings can be made



Two ABB drives keep the water flowing at West of Scotland Water's Lomond Street waste water pumping station, Helensburgh, Scotland saving £80,000 in energy over 20 years.

- Helps to justify investments in energy efficiency
- Determines easy-to-apply solutions for improved energy efficiency

This highlight is applicable to LV & MV drives, and motors & generators and LV products & systems.

Highlights

Asset monitoring and remote diagnostic services

ABB's automation products are highly intelligent devices, which not only can monitor the production process but also themselves by collecting diagnosis and status data. Device specific asset monitors continuously analyze this data in order to trigger any exceptional or critical conditions. If such a condition occurs, it is logged and classified according to its severity. Operation and maintenance personnel receive information about the condition on-site or in a remote location with a description of the condition, possible cause and suggested action to be taken.

By combining asset monitoring with diagnostic services over a secured remote connection, customers can benefit from enhanced technical support and monitoring capabilities. With equipment diagnostic information data at their finger tips, ABB's technical support specialists can quickly understand the scope of a support issue and significantly reduce the time to resolution.

Three levels of remote services

Troubleshooting	On-demand remote diagnostic support for a specific problem or failure by ABB's technical support service.
Periodic maintenance	Scheduled asset audits and evaluation against established benchmarks are performed. A detailed health check report is provided, which includes a summary of findings and recommended preventive and corrective maintenance.
Continuous monitoring	Continuous asset monitoring with real-time alarming. Asset conditions exceeding pre-established thresholds trigger immediate response through the escalation process.

Benefits:

- Reduced maintenance effort and cost, increased plant productivity
- Enables condition based maintenance
- Specific operation points can be monitored
- Rapid access to product expertise
- Faster service response



Asset monitors for drives (top) and LV switchgear (above).

This highlight is applicable to instrumentation, LV circuit breakers, LV switchgear, LV and MV drives, motors & generators and excitation systems.

Highlights

Preventive maintenance services

Without proper maintenance, the probability of mechanical components in rotating machines failing after a certain time is significant due to normal wear and tear. Therefore it is a well accepted practice to perform preventive maintenance on rotating machinery to significantly reduce the risk of this happening.

Although today's industrial electronic components are highly reliable and seldom are exposed to mechanical stress, they also need preventive maintenance at certain points in their life cycle in order to prevent them from failing. In many cases, the main reasons for failure are aging of components and harsh or improper operational conditions (heat, humidity, dirt, etc.).

Standardized preventive maintenance programs have been created for various ABB automation products. These programs typically consist of periodic, condition related inspections (visual, thermographic or other measurements), predefined component changes and thorough cleansing.

Preventive maintenance is either performed on-site or at standardized service workshops, which allow comprehensive product reconditioning and complete testing with factory level processes and quality.

Product specific maintenance schedules and preventive maintenance kits make maintenance easy to perform and budget.

Preventative maintenance program elements

Maintenance schedule	A standardized plan, which provides a systematic and functional means of maintaining a specific product
On-site preventive maintenance	Typically includes needed parts and labor to carry out maintenance for a specific product
Off-site preventive maintenance ie reconditioning	Complete reconditioning of a product at a service workshop. Same content as with on-site maintenance but includes full cleansing and testing
Preventive maintenance kit	A PM kit contains all the required parts for specific product maintenance

Benefits:

- Reduced maintenance costs
- Easy to plan long term maintenance material budget
- Increased maintenance performance efficiency
- Easy to order, pre-defined, genuine service parts are provided according to the maintenance schedule



An example of a preventive maintenance kit for a low voltage drive.

This highlight is applicable to instrumentation, LV products & systems, LV & MV drives, converters, rectifiers, power quality products, excitation systems and motors & generators.

Highlights

Upgrades and retrofits

Extending a product's lifetime is sometimes a more economical option than a complete replacement. This is especially valid in cases where no additional product functionality or performance is required and the maintenance of legacy equipment starts to be too expensive or difficult due to the lack of spare parts or absence of technical competence.

Many of ABB's automation products have successfully served their application for over 10 or 20 years and may continue to do so for some years to come. In order to enable an extension to the product life cycle, ready-made and easy-to-apply upgrade and retrofit kits are designed for several product lines. A few examples of those are outlined below.

Some examples of upgrade and retrofit solutions

LV breakers	Conversion kits for legacy breakers such as OTOMAX, ISOL/FUSOL, NOVOMAX G30, MODUL, NOVOMAX G and MEGAMAX F
LV switchgear	Upgrading of legacy MNS 1.0 and 2.0 (1st and 2nd generation) to MNS 3.0 with modern intelligent technology for motor control, by using same footprint and keep all outgoing cables in operation
LV drives	Retrofit kits for legacy DC drives such as Tyrak, Veritron and SELE and AC drives such as SAMI STAR and ACV700. Upgrade kits for legacy DC drives such as DCS500, DCS500 B, DCS600 and DCV700.
MV drives	Upgrading of old PSR control with AC 800 PEC controller for MEGADRIVE-LCI variable speed drives and soft starters.
Power electronics	Control system upgrade in excitation systems (e.g. UNITROL D to UNITROL 6000) and or rectifiers (e.g. old control system to new AC 800 PEC control platform).
Induction motors	Upgrading of legacy induction motors (e.g. WRIM, SQIM) to variable speed operation.
Instruments	Upgrading of electromagnetic flowmeter electronics to extend useful life of flow device and also enable in-situ calibration verification.

Benefits

- Extended product or system lifetime
- No production losses – retrofit or upgrade is planned to match the plant's shutdown schedule
- Reduces capital expenses – re-uses ancillary equipment
- Modern technology with enhanced performance and functionality
- Better availability of spares and technical support



Upgrading electromagnetic flowmeter electronics.



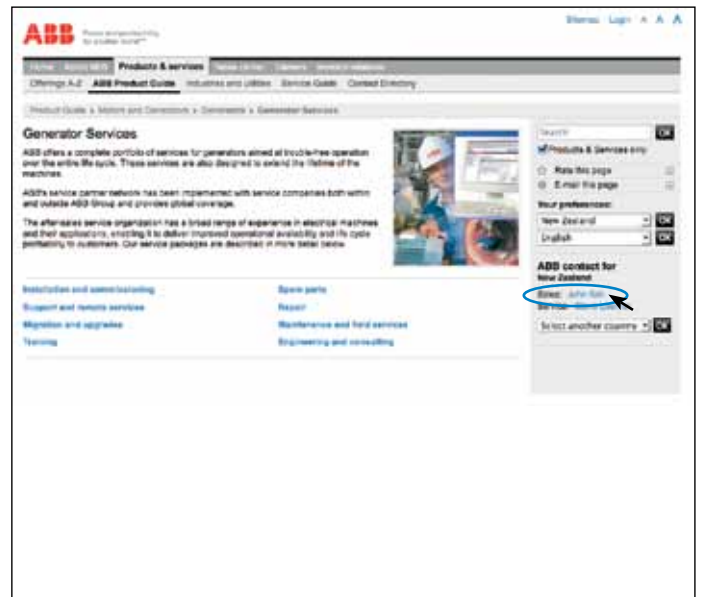
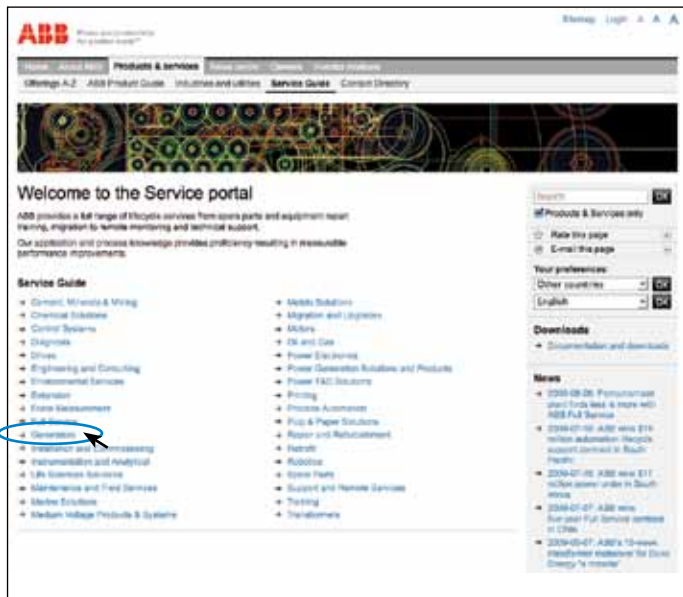
ABB industrial drive modules installed into SAMI STAR drive cabinets in a retrofit.

This highlight is applicable to instrumentation, LV products & systems, LV & MV drives, converters, rectifiers, excitation systems and motors & generators.

ABB is a leading supplier of automation products and services. It operates in more than 100 countries and has one of the largest service organizations with field service engineers located all over the world.

Wherever you are, ABB is there for you

To obtain a service contact around the world please access **www.abb.com/service**. Click on the desired product from the list and then on the country you require to get your contact.



Contact us

For more information see

www.abb.com/service

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Printed in UK (11.2009)