

SERVICE NOTE

Life Cycle Services for the ACS800-67 wind turbine converter

Enhance your wind park performance and uptime



Harsh operating environments in wind parks, and the high cost of repairs, make proactive Life Cycle Services a good investment. ABB offers a variety of services to maintain performance, increase reliability, improve operations and upgrade wind turbine converter components to the latest technology. This helps maximize long-term value for asset owners via tailor-made converter solutions.

01 ACS 800-67 Wind Turbine Converter

The right service at the right time

The frequency converter – one of the most complex and vital parts of a wind turbine – plays a decisive role in energy production. After 10 years of continuous operations some maintenance work is usually needed to improve reliability and help avoid unplanned downtime.

Shifting paradigm: From corrective to proactive

Proactively planning maintenance work greatly reduces the occurrence of failures and ensures optimal operation, with minimal headaches.

ABB has designed several service solutions for the ACS800-67 that simplify maintenance actions to modernize the converter, thus updating it with state-of-the-art hardware and features.

We combine inspection, preventive maintenance, reconditioning and upgrade services to put the converter in a more modern and technically advanced state than when it originally left the factory. This helps optimize both your costs and your maintenance efforts.



Increased operational reliability

You gain big benefits from the latest converter improvements and developments, to increase uptime.



Quick installation

Components and solutions are already customized, and thus require a minimal amount of downtime for installation.



Optimized maintenance cost

Increased reliability, thanks to the latest technology, minimizes the future cost of repairs.



Extended product support

Upgrading to the latest hardware and software guarantees the best support and prolongs the active life of your converter.



- 1 Helsinki, Finland
- 2 Barcelona, Spain
- 3 New Berlin, USA
- 4 Sorocaba, Brazil
- 5 Beijing, China

■ Covered by regional or local service workshop ■ Covered by global service workshop in Finland

01 ABBs global drive service workshops network specialized in wind converters

02 Performance development with proper maintenance and with ABB life cycle services and upgrades

Preventive maintenance

Replacing components which are impacted by wear and tear, at the right time, ensures the correct operation of your converter.

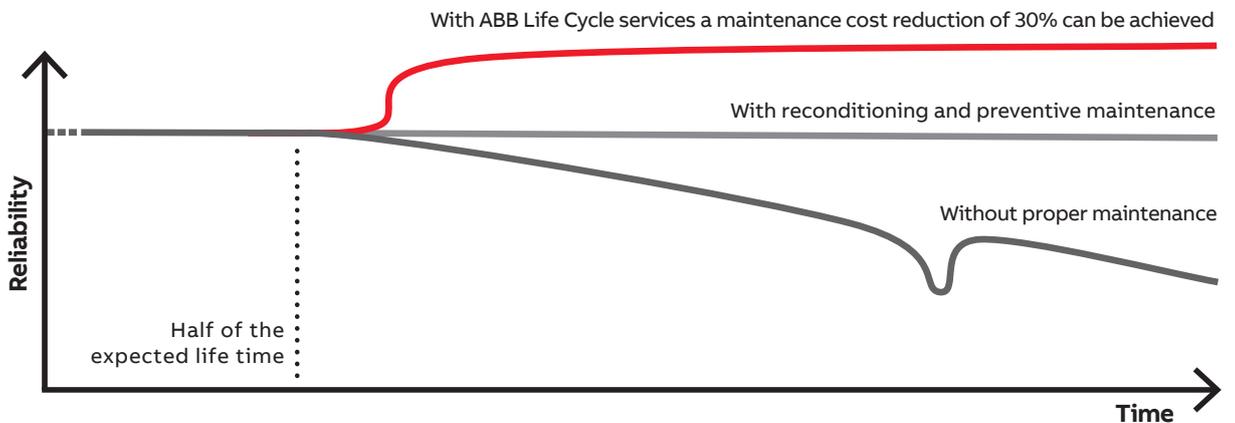
ABB's preventive maintenance kits contain all the genuine spare parts needed to perform a specific maintenance task, thereby simplifying purchasing, on-site actions and cost.

Reconditioning – a new lease on life

ABB recommends that converter inverter modules should be restored to original factory condition at least once in their lifetime. Reconditioning should be considered when major components, such as electrolytic capacitors or control boards, need replacing according to the preventive maintenance schedule.

This service includes a complete inspection, thorough cleaning and analysis of individual components, as well as part replacements according to the maintenance schedule and the results of the detailed component analysis. The reconditioned inverter module is then fully tested to ensure optimum quality and performance.

ABB's wind turbine converter reconditioning service is done at an authorized ABB service workshop, in a clean environment and with suitable testing facilities. A global network of authorized local and regional drives service workshops offer a consistent approach to guarantee a high quality repair and reconditioning process.



Hardware upgrade

While reconditioning and preventive maintenance can restore reliability and performance to factory-new conditions, a component upgrade provides even further long-lasting improvement and the latest functional features throughout the lifetime of the converter.

Main benefits of wind converter upgrades are:

Upgrade of data monitoring unit

- Provides highly-effective and reliable monitoring.
- Enables advanced remote and cloud services like ABB Ability™ Condition Monitoring and ABB Ability™ Remote Assistance.

Grid connectivity upgrade

- Adding a brake chopper and an auxiliary voltage measuring unit provides a faster low- and high-voltage ride-through reaction, meeting possible changes in the grid code.

Reliability and design upgrades

The ACS 800-67 has the following upgrade kits which increase the reliability of the converter:

- Inverter module upgrade
- Long-life fan upgrades
- LCL-filter upgrade
- Active crowbar
- Contactor upgrade
- Slide-out frame improvement
- Firmware upgrades

Inspection and diagnostics

Before undertaking any extensive maintenance action, it is important to know the current state and condition of your converter. ABB's health and stress check provides the necessary support to analyze the converter condition to determine the further steps needed to optimize your maintenance.

ABB Health Check

Gives a detailed diagnostic report of inspections and measurements, including condition analysis, maintenance recommendations and operational advice to improve reliability.

ABB Stress Check

Surveys and analyzes the impact of stress from the environment on the converter, thus giving maintenance recommendations and valuable operational advice.

Service delivery process



1 Check converter status

If your ACS800-67 wind turbine converter has reached about half of its expected life, it's time to think about ABB lifecycle solutions.



2 Order and perform stress and health checks

ABB's expertise will help you assess possible failure root-causes, which will help determine the services that match your needs.



3 Order service and upgrade kits

Define an action and delivery plan together with ABB.



4 Installation

An ABB specialist or own certified service engineer will perform agreed work, both on- and off-site.



5 Commissioning

Only final commissioning needs to be done by ABB, to ensure warranty requirements and high quality of the installation.



6 Continue operating efficiently

Your converter is now up to date with all the latest improvements.

Upgrade kits

The modification options

ABB has created a range of component packages offering simple upgrade options that customers can select according to their specific needs.

All kits include the following:

- All necessary electrical and mechanical parts
- Software and required firmware upgrades
- Ready-made and tested cables and connections
- Installation instructions for an ABB certified engineer to perform the on-site work

Remote monitoring and analysis

By replacing the data gathering interface NETA-01 with the new NETA-21, robust local data storage is possible. This upgrade enables constant monitoring and analysis of the performance of the converter.

Wireless modem for connectivity

Provides remote connection if a wired local internet connection is not available.

Extra Datalogger unit APBU

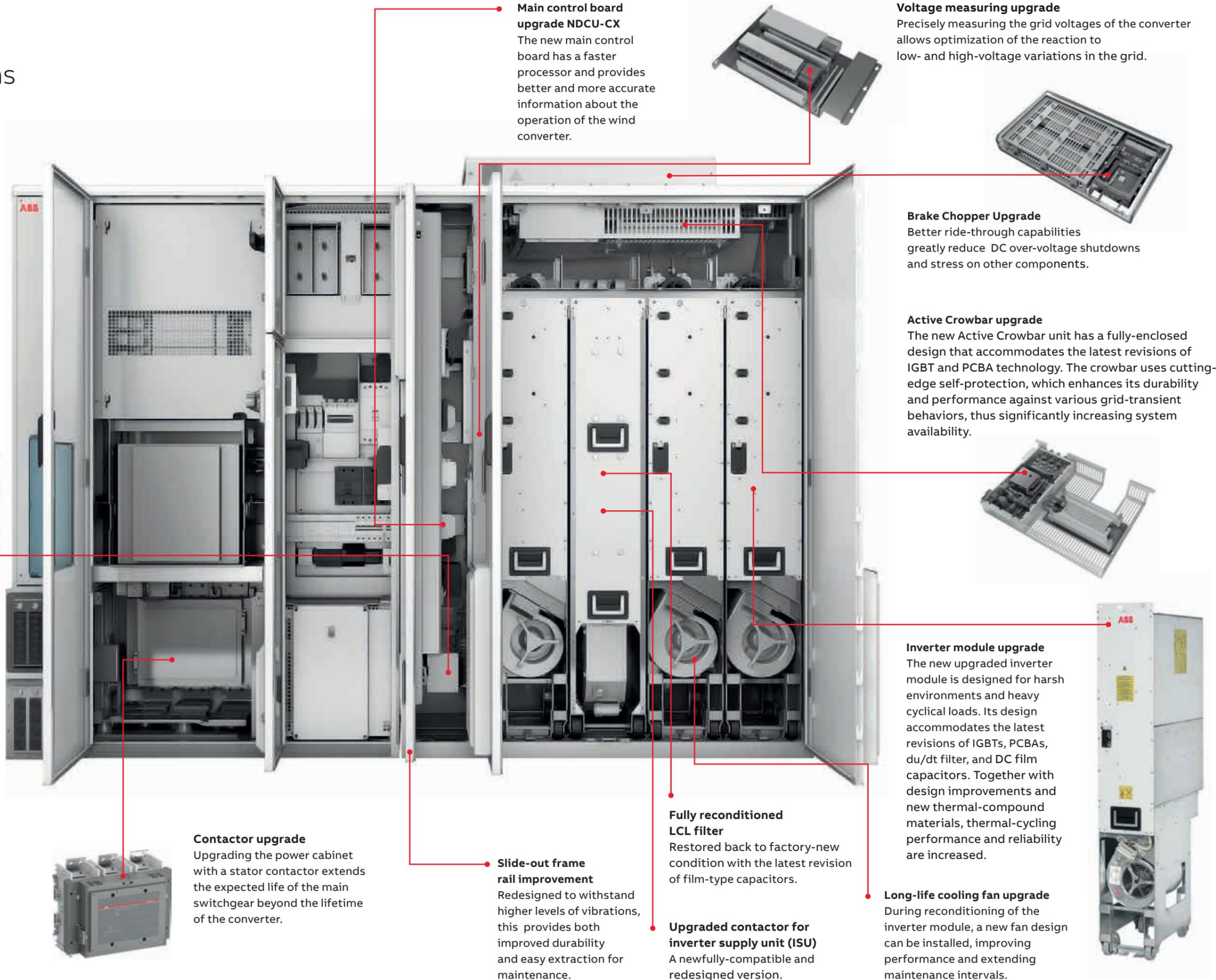
Gathers high-frequency data for any fault in the grid-side converters for precise fault tracing.

Advanced remote services enabled by NETA-21

ABB Ability™ Condition Monitoring delivers accurate realtime information from your converter. Operational data is stored safely, analyzed and accessible from anywhere through the cloud.



ABB Ability™ remote assistance provides 24/7 support no matter where the wind turbine is located. With the remote data gathering, problems and solutions can be identified more quickly to restore normal operations.



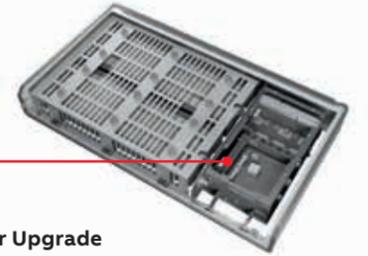
Main control board upgrade NDCU-CX

The new main control board has a faster processor and provides better and more accurate information about the operation of the wind converter.



Voltage measuring upgrade

Precisely measuring the grid voltages of the converter allows optimization of the reaction to low- and high-voltage variations in the grid.

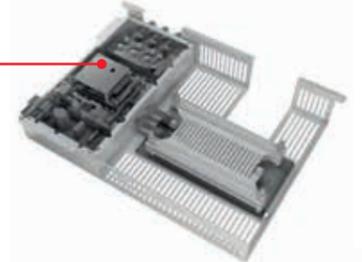


Brake Chopper Upgrade

Better ride-through capabilities greatly reduce DC over-voltage shutdowns and stress on other components.

Active Crowbar upgrade

The new Active Crowbar unit has a fully-enclosed design that accommodates the latest revisions of IGBT and PCBA technology. The crowbar uses cutting-edge self-protection, which enhances its durability and performance against various grid-transient behaviors, thus significantly increasing system availability.



Inverter module upgrade

The new upgraded inverter module is designed for harsh environments and heavy cyclical loads. Its design accommodates the latest revisions of IGBTs, PCBAs, du/dt filter, and DC film capacitors. Together with design improvements and new thermal-compound materials, thermal-cycling performance and reliability are increased.



Long-life cooling fan upgrade

During reconditioning of the inverter module, a new fan design can be installed, improving performance and extending maintenance intervals.

Fully reconditioned LCL filter

Restored back to factory-new condition with the latest revision of film-type capacitors.

Upgraded contactor for inverter supply unit (ISU)

A new fully-compatible and redesigned version.

Slide-out frame rail improvement

Redesigned to withstand higher levels of vibrations, this provides both improved durability and easy extraction for maintenance.

Contactor upgrade

Upgrading the power cabinet with a stator contactor extends the expected life of the main switchgear beyond the lifetime of the converter.



Overview of ACS800-67 life cycle services

Benefits Achieved	Increases Uptime	Improves operational reliability	Increases performance	Adds functionality	On-site work	ABB service
Service Activity						
Inspection and diagnostics						
Health and Stress Check ¹	X	X	X	X	X	X
Preventive Maintenance						
PM 1 - Kit Door filter - every year	X				X	
PM 6 - Kit Cooling fans ² - every 6 years	X				X	
PM 9 - Kit-inverter module control boards and flat cables - every 9 years	X					X
Workshop Services						
Exchange Unit - fast inverter module replacement	X	X				X
Reconditioning - inverter module replacement of all aging components	X	X				X
Inverter Module Upgrade - upgrade to latest component version	X	X	X			X
Hardware Upgrades						
Remote connectivity and monitoring upgrade - NETA-21 and optional extra data logger and wireless modem			X	X	X	
Inverter module upgrade delivered as a replacement module	X	X	X		X	
Active crowbar upgrade	X	X	X		X	
Contactors upgrade	X	X	X		X	
Mechanical slide-out frame upgrade	X	X			X	
Firmware upgrade	X	X	X	X	X	
Grid interaction enhancement ⁴	X	X	X	X	X	
Advance remote service¹						
ABB Ability™ Condition Monitoring						
ABB Ability™ Remote Assistance	X	X	X	X		X
Predictive Maintenance ³						
Inspection and commissioning	X	X	X		X	X

1) Requires NETA-21 upgrade

2) Depends on actual load and ambient condition, up to 9 years can be reached with long-life inverter module fans

3) Subject to local availability

4) Auxiliary voltage measuring, Brake chopper upgrade and firmware upgrade are needed