Services note
Reduce ACS800 drive operating costs with preventive maintenance and reconditioning services

ABB recommends its preventive maintenance and reconditioning services to help control and cut operating costs associated with its drives. On-site preventive maintenance is designed around drive maintenance schedules and significantly reduces the risk of failure while increasing the lifetime of a drive. Reconditioning in an authorized ABB drive service workshop should be considered when major components need replacing according to the maintenance schedule. Both services contribute to higher reliability of the installed plant which in turn helps maintain high productivity.

The importance of maintenance

The failure probability of industrial products equipped with electronic components, such as drives, increases over time. The main reason for failure is aging of components, but it is also greatly affected by the operational conditions. A demanding environment, such as high ambient temperature, humidity, dirt, dust and cyclic heavy loads, can shorten component lifetime as well as maintenance and component replacement intervals.

A component failure may cause consequential damage to other parts of the drive, including power semiconductors.

A maintenance schedule provides a systematic and functional means of maintaining a specific drive type and is based on ABB's extensive experience and know-how of manufacturing and maintaining electric drives.

Preventive maintenance – the lifeblood of a drive

Drive preventive maintenance consists of annual drive inspections and component replacements according to the product specific maintenance schedule. Specifications of component suppliers are carefully observed, while the environmental and operational conditions of the drive are also considered.

Preventive maintenance is carried out during planned production shutdowns. It should be planned well in advance and the required resources and service parts reserved. Parts and materials used in preventive maintenance are bundled into preventive maintenance kits which are delivered to a lead-time, unlike normal spare parts.

The success of preventive maintenance depends on the information recorded in the service reports provided by the end-user. The more thorough the information provided, the greater the benefit.

All labor and service parts included

The preventive maintenance service includes labor, if not agreed otherwise, and the service parts to perform the work according to the maintenance schedule.

Included are inspections of the:
- electric drive and its environmental conditions
- connections
- ribbon and fiber optic cables
- fan and cooling system
- emergency stop circuit
- circuit to prevent unexpected startup
- fault logger
- parameters

Tests include:
- functional testing of the drive under normal conditions
- basic measurements with supply voltage

In addition, the following can be purchased as options:
- ESD protected cleaning of the drive
- reforming of the spare module capacitors
- drive spare part inventory

A detailed service report, including recommendations for future actions, is provided once the maintenance work is completed and the inspection data fully analyzed.

	Years from startup																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Startup	P																					
Cooling																						
Air-cooled unit																						
Internal/additional cooling fan for ACS800-01, -04, -11, -31, -104 (IP20, IP21 and IP55)		I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R
Cooling fan for ACS800-01, -02, -04, -07, -11, -17, -31, -37, -14, -104, DSU, ISU, ALCL		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Cooling fan for DSU+V992 (mains supply frequency 50 Hz)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Cooling fan for DSU+V992 (mains supply frequency 60 Hz)		I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R
Cooling fan for TSU		I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R
Enclosure extension cooling fan (ACS800-02)		I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R
Extra cooling fans inside cabinet (ACS800-x7, ACS800 multidrive)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Extra IP54 cooling fan on roof of cabinet (ACS800-07, ACS800 multidrive)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Liquid-cooled unit																						
Cooling fans		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Addition of inhibitor		I	P	I	P	I	P	I	P	I	P	I	P	I	P	I	P	I	P	I	P	I
Change of coolant in the internal cooling circuit										R									R			
Heat exchanger cleaning			I		I		P		I		I		P		I		I		P		I	
Expansion tank air pressure			I		I		I		I		I		I		I		I		I		I	
Expansion tank										R									R			
Cooling liquid pump assembly		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Cooling liquid pipe connections		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Aging																						
Electrolytic capacitors (DC circuit)										R									R			
Memory backup battery replacement in the APBU-xx unit		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Connections and environment																						
AINT+ flat cables, CINT, NRED, discharging resistors										R									R			
Tightness of terminals							I						I						I			
Quick connector of converter module (ACS800-x7, ACS800 multidrive)				I			I			I			I			I			I			I
Door filters (IP20 to IP42)		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Door filters (IP54 and above)		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Condition of contactors				I			I			I			I			I			I			I
Fiber optic cables (connections)				I			I			I			I			I			I			I
Dustiness, corrosion and temperature		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Quality of supply voltage		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Improvements																						
Based on product notes		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Measurements																						
Basic measurements with supply voltage		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Spare parts																						
Spare parts		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
DC circuit capacitors reforming		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Note! Recommended maintenance intervals and component replacements are based on specified operational and environmental conditions. ABB recommends annual drive inspections to ensure the highest reliability and optimum performance. More detailed maintenance information can be found in maintenance instructions, product manuals and on the Internet.

Legend:
I = Inspection (visual inspection and maintenance action if needed)
P = Performance of on/off-site work (commissioning, tests, measurements or other work)
R = Replacement of component

A preventive maintenance kit is a selected package of parts needed for preventive maintenance of ABB drives. 6- and 9-year preveventive maintenance kits for ACS800 multidrives are shown above and for ACS800 single drives, shown below.

Preventive maintenance kits

Preventive maintenance kits contain all the necessary replacement parts for a scheduled maintenance. The content of each kit is carefully selected to match the maintenance schedule and the size and other characteristics of a specific drive.

Preventive maintenance kits can be selected and ordered according to the number of drives in use and their age, ensuring that all the required parts are available for maintenance.

The parts contained within a preventive maintenance kit cost less than parts sourced individually. Therefore, engaging in a proactive preventive maintenance plan will prove more cost effective than sourcing spares as a result of an emergency or general repair job. The local ABB representative can define, select and deliver the correct parts and help plan preventive maintenance. Visit www.abb.com/drives to find your nearest ABB representative.

Preventive maintenance kits for	Yearly	Every 3rd year	Every 6th year	Every 9th year
Internal/additional cooling fan for ACS800-01, -04, -11, -31, -104 (IP20, IP21 and IP55)		x		
Cooling fan for ACS800-01, -02, -04, -07, -11, -17, -31, -37, -14, -104, DSU, ISU, ALCL			x	
Cooling fan for DSU +V992 (mains supply frequency 50 Hz)			x	
Cooling fan for DSU +V992 (mains supply frequency 60 Hz)		x		
Cooling fan for TSU		x		
Enclosure extension cooling fan (ACS800-02)		x		
Extra cooling fans inside cabinet (ACS800-x7, ACS800 multidrive)			x	
Extra IP54 cooling fan on roof of cabinet (ACS800-07, ACS800 multidrive)			x	
Door filters (IP54 and above)	x			
Electrolytic capacitors (DC circuit)				x
AINT+ flat cables, CINT, NRED and discharging resistors				x
ACS800LC units cooling fan			x	
ACS800LC units coolant in the internal cooling circuit				x
ACS800LC units expansion tank				x
ACS800LC units cooling liquid pump assembly			x	

Reconditioning – giving drives a new life

While, within preventive maintenance, component replacements can be carried out on-site, ABB recommends that, at least once in the drive's lifetime, it is reconditioned to its original factory condition.

Reconditioning should be considered when major components, such as electrolytic capacitors, need replacing according to the maintenance schedule.

The ABB drive reconditioning service is carried out at an authorized ABB drive service workshop within a clean environment and with suitable testing facilities. The service includes a full inspection, thorough cleaning and the analysis of individual components, as well as part replacements according to a product specific maintenance schedule. The reconditioned drive is then fully tested.

With on-site preventive maintenance, only the replaced parts come with a warranty whereas with reconditioning the entire module or drive carries a warranty.

Complete reconditioning

When the drive arrives at the ABB workshop, the following is carried out:

- visual inspection
- electronic boards are dismantled and cleaned ultrasonically
- mechanical parts are washed
- after drying, individual components are analyzed and replaced according to a product specific maintenance schedule
- software is updated

Tests include:

- functional testing
- a load test, using a minimum 50 percent of nominal load

Once all stages are complete, a service report is compiled and a 12 months warranty issued for the complete module or drive.

Exchange units may be available during the reconditioning period. The ABB service engineer or local sales office will be able to advice.

Non-repairable drives

Following reconditioning, ABB returns the drive with its functionality fully restored. However, if at the workshop the drive is examined and fails to meet ABB's quality standards, ABB can declare the drive non-repairable. Common reasons for a drive to be declared non-repairable include heavy mechanical damage and corrosion.

If an item is declared non-repairable, ABB informs the customer without delay and offers alternative solutions.

Summary

The advantages and benefits of preventive maintenance include:

Advantage	Benefit
Use of genuine service parts	Increased reliability leading to longer component lifetime
Timely part replacements in accordance with maintenance schedule	Increased reliability leading to reduced drive and plant operational lifetime costs
Economical kit pricing compared to individual part price	Lower operational lifetime costs
Maintenance schedules help long term maintenance budget planning	Schedules help define whether to continue maintenance or to upgrade, retrofit or replace a drive
Updating to the latest software version	Ensures optimum drive performance

In addition to the above, reconditioning includes the following advantages and benefits:

Advantage	Benefit
Clean service workshop environment, washing facilities, ESD protected working conditions and comprehensive testing arrangements to maximize the reconditioning quality	Drive returned to its original condition and entire drive delivered with one year warranty

For more information, please contact your local ABB representative at:

Phone: 1-800-435-7365 option 4
Fax: 1-860-298-3526
email: sales.drives.services@us.abb.com

www.abb.com/drives
www.abb.com/drivespartners

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