

Preventive maintenance for ACS1000 AC drives

ABB recommends regular preventive maintenance of AC drives throughout their lifetime to ensure maximum availability, minimum unplanned repair costs, optimized performance and extended lifetime.

Drive preventive maintenance consists of annual drive inspections and component replacements according to the product specific maintenance schedule.



Drive preventive maintenance is based on ABB's extensive knowledge and experience in manufacturing and maintaining AC drives for more than 30 years and it takes environmental and operational conditions into account. Qualified and certified drive specialists perform preventive maintenance work.

Benefits

- Increased drive reliability
- Optimized maintenance costs and minimized repair costs
- Easy-to-plan maintenance budget
- Extended drive lifetime
- Genuine, factory-certified ABB parts

Service provided

Preventive maintenance service includes labor and the service parts to perform the maintenance work according to the maintenance schedule:

- Visual inspection of the electric drive and its environmental conditions
- Inspection of the connections
- Inspection of the ribbon and fiber optic cables
- Functional inspection of the fan and cooling system
- ESD protected cleaning of the drive
- Inspection of the emergency stop circuit
- Inspection for the prevention of unexpected start-up circuit
- Inspection of the fault logger
- Inspection and storage of the parameters
- Functional testing of the drive under normal conditions
- Basic measurements with supply voltage
- Inspection of the drive spare part inventory
- Reforming of the spare module capacitors

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

Ready-made preventive maintenance kits are available at www.abb.com/partsonline for component replacements marked "R" in the maintenance schedule.

Preparations before preventive maintenance

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

ABB must have free access to the drive for maintenance during the shutdown as agreed. Preventive maintenance must be planned well in advance in order to reserve the required resources and service parts.

Maintenance schedule

Based on ABB's experience, failure probability of industrial products equipped with electronic components, such as drives, increases after years of operation. For electric drives this is typically 5 to 10 years. The main reason for

Product Lifecycle Services

- Installation & Commissioning
- Training
- Support & Remote Services
- Spare Parts & Repairs
- Maintenance & Field Services
- Migration & Retrofits
- Optimization



failures is aging of components, but it is also greatly affected by the operational conditions. 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. It is based on the extensive experience and know-how of manufacturing and

maintaining electric drives. Specifications of component suppliers are observed carefully. The environmental and operational conditions of the drive are also considered. A demanding environment, such as high ambient temperature, humidity, dirt and cyclic heavy load, can measurably shorten component lifetime and also maintenance and component replacement intervals.

	Years from start-up																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Start-up	P																				
Estimated Working Time (hours) 1		4	8	4	12	4	8	4	16	4	8	4	24	4	8	4	16	4	8	4	12
Cooling																					
➤ Air cooled unit:																					
➤ Air filters 2	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
➤ Cooling fan 3	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I
➤ Red. cooling fans 3	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	R	I	I	I	I	I
➤ Water Cooled Unit:																					
➤ De-ionizer and micro filter 4	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
➤ Cooling pump gasket	I	R	I	-	I	R	I	-	I	R	I	-	I	R	I	-	I	R	I	-	I
➤ Cooling pump (including gasket) 3	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I
➤ Red. cooling pump gasket	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I
➤ Red. cooling pump (incl. Gasket) 3	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	R	I	I	I	I	I
➤ Aux cooling fan 3	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	I
➤ Redundant aux cooling fans 3	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	R	I	I	I	I	I
➤ Strainer	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Aging																					
➤ Capacitors 5	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
➤ Printed Circuit Boards 6	I	I	I	P	I	I	I	P	I	I	I	R	I	I	I	P	I	I	I	P	I
➤ Battery	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I
Connections & Surroundings																					
➤ Fiber optic cables	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
➤ Cable connections	I	I	I	I	I	I	I	I	I	I	I	I	I	I	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
Improvements																					
➤ Improvements 8	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Measurements																					
➤ Measurements with auxiliary voltage	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Insulation test	-	-	-	P	-	-	-	P	-	-	-	P	-	-	-	P	-	-	-	P	-
Spare Parts																					
➤ Spare parts 6	I	I	I	P7	I	I	I	P7	I	I	I	R7	I	I	I	P7	I	I	I	P7	I

Note! Recommended service intervals and component replacements are based on the operational environment specified by ABB. ABB recommends drive inspections to be carried out annually to ensure the highest reliability and optimum performance. More information in service instructions, product manuals and on the Internet pages.

1. Typical needed working time on the converter (does not include preparation-, closing-, waiting- or traveling-time)
2. The air filters can be replaced or cleaned, the action should be made based on actual condition of the filter
3. The cooling pumps and fans can either be serviced by an authorized service-representative or completely replaced
4. The average lifetime of the deionizer is 2 - 4 years, depending mainly on the actual water quality, the micro filter should be replaced at the same time as the deionizer, it is recommended to replace both when the actual conductivity reaches the alarm level, not preventively
5. The expected life time of the capacitors depends mainly on the ambient conditions, based on the maximum allowed temperature in the converter, the expected lifetime is about 180 000 hours, the actual replacement should be based on the annual measurements, not on time
6. The printed circuit boards in the converter and among the spare parts can be replaced with new ones or replaced with refurbished ones
7. Only the printed circuit boards needs to be replaced, for the other spare parts are no actions needed
8. Converter improvements based on development, software modifications etc.

Legend:

- R = Replacement of component (At rated load and ambient conditions)
- I = Inspection (visual inspection, correction and replacement if needed)
- P = Performance of on-site work (commissioning, tests, measurements, etc.)
- = No action

