

Preventive Maintenance

Cooling Fans



Scope of this document

Cooling fan is essential component in many drive products. It provides a thermal management by creating an airflow, thus lowering the temperature inside the drives. It provides high efficiency and performance by removing the heat generated inside the drive. There are several different fan options available: AC fan, DC fan and newest EC fan. They all have different characteristics in terms of operation.

The lifetime of a fan is highly dependent on the application conditions and is affected by both electrical and environmental factors. Common stresses that influence fan reliability are temperature, temperature

change, humidity, humidity change, voltage, corrosion, vibration, mechanical shock and radiation. Since several failures in the field can be traced back to thermal related issues, the reliability of cooling fans is a critical part of the overall reliability of thermal management in drives.

Reasons for the preventive maintenance

A cooling fan is an ageing component. Fan assembly consists of both mechanical and electrical parts. Thus, it can fail electrically, mechanically or both. The mechanical parts of a fan consist of bearing, lubricant, shaft, fan blades, or propeller/impeller and the fan housing. The electrical parts include control circuitry, electrical motor and electrical parts. Failure in the cooling fan operation in the designed operation point, will cause overheating in drive, which will reduce the performance of the drive and exposes to multiple other failure mechanisms.

Following effects are caused by fan aging:

- Poor cooling performance due to slowed fan (RPM decrease)
- Acoustic failures, fan noise level increased
- Bearing and lubricant wear-out
- Input current increase

Preventive maintenance is an undeniably critical part of any maintenance strategy. By taking necessary maintenance actions, failures can be prevented before they occur. Preventive maintenance is not only predictable, but also cheaper, than repairing already failed drive. It's key for **avoiding unfunctional drive, decreases unexpected downtime, reduces costly repairs, improves reliability, enhances drive life expectancy, increases safety** and reduces risk of injury. If preventive maintenance action are not carried out, it can result in **total breakdown of the drive.**

ABB recommends changing wearing components to avoid risk of failures in frequency converter. Check maintenance schedule for recommended maintenance intervals and component replacements for a specific drive.