

Upgrading of existing induction motors (WRIM, SQIM) to variable speed operation



Save energy, reduce maintenance and boost production quality and control

An upgrade of existing induction motors to variable speed operation brings many advantages. The installation is simple, especially since the customer often can keep the motor they already have.

Many industries have already made the transition and ABB offers a highly competitive retrofit package for the ones to follow. The package contains ABB's new frequency converters, an assessment of needed motor service, and the service itself.

Advantages

The main advantages of variable speed operation are:

- high overall efficiency → to save energy
- wide speed range → mechanical equipment (valves, dampers) can be avoided → less maintenance
- soft starting → less mechanical stress on motor, coupling and load
- better process control and quality → better product quality and reduced cost of poor quality
- speed reversal / regenerative braking



SM301 EN REVA 2007

Service Notes

Pay-back

The initial investment in new equipment is quickly repaid in terms of increased production, energy saving and improved quality. Yet, to keep the initial investment low, ABB has a highly flexibility offer such that the customer in many cases can keep its existing installation and just add a frequency converter.

Our offering

The first step is an assessment of the existing installation to investigate its suitability for variable speed operation. The main task is to verify the electrical data of the motor under operation with VSD and to confirm new rating plate data.

Furthermore following aspects are examined:

- stator voltage / star-delta connection
- motor cooling
- bearings / bearing insulation
- torsional behavior
- lateral behavior
- stator winding condition

Above of obtained result are summarized in a short report.

Often, the customer can provide the information in writing and pictures. In some cases, the motor must be inspected at customer site (e.g. for a thorough stator winding diagnosis).

Based on the assessment, ABB proposes a retrofit program to prepare the motor for variable speed operation. It may include services such as:

- re-connection of stator winding (star → delta)
- complete rewinding of stator
- short circuit of rotor winding (in case wound rotor induction motor)
- modification of cooling system
- general overhaul of the motor
- torsional analysis
- lateral analysis
- stator winding diagnosis LEAP (Life expectancy analysis program)

If the motor is not suitable for variable speed operation, ABB will offer a new motor optimized for the assessed working conditions.

Installation

ABB performs the motor upgrade to variable speed operation with minimum impact on daily operation. Keeping and servicing the existing motor instead of replacing it offers several customer benefits besides the improvements to cost, energy savings and quality:

- no modification of existing motor foundation and interfaces (oil, water, auxiliaries)
- further use of already available motor spare parts
- maintenance staff is familiar with motor

When upgrading to variable speed operation, we always recommend the customer to consider upgrading the existing motor before buying a new one!

