



BY JOHNSON CONTROLS

Service Information

File In/With: N/A

SI0192

New

808

Equipment Affected: YK & YT Centrifugal Chillers

Motor Qualification and Evaluation for Aftermarket Medium-Voltage VSD Application

MOTOR QUALIFICATION FOR AFTERMARKET VSD APPLICATIONS

YORK Engineering along with Service Marketing, and the YORK Parts Center conducted a review of variable-speed drive (VSD) application criteria due to the aging of the existing population of installed chillers. During this review several motor rules were put in place to mitigate/minimize risk exposure of the local branch business with respect to questionable aftermarket VSD applications.

The purpose and goal of the committee and the decisions made by it were to:

1. Address the issues and risks associated with retrofitting an aging population of chillers.
2. Determine the appropriate policy with our customer's best interests in mind.
3. Ensure that policy limited risk exposure to the business while allowing for our local branch teams to properly serve our existing equipment customers and generate revenue growth.

In the several years of successful application of YORK medium-voltage variable-speed drives there has NOT been a significant experience of motor failures directly related to the VSD retrofit. However, it is recognized that there exists an inherent risk associated with retrofitting to aged preexisting chiller equipment of unknown condition. Therefore, it is necessary that the chiller motor is locally evaluated to ensure it is physically and electrically suitable for aftermarket VSD retrofit application, refer to the MOTOR EVALUATION FOR AFTERMARKET VSD APPLICATIONS section.

MV MOTORS **QUALIFIED** FOR VSD APPLICATION – subject to local evaluation

024-26513- & 024-26514-	2300/4160V – 0XX, 1XX, 2XX, 3XX, 4XX, 5XX, 6XX, 7XX 3300V – 0XX, 1XX, 2XX, 3XX, 4XX, 5XX, 6XX, 7XX
024-26515-	2300/4160V – 0XX, 1XX, 2XX, 3XX 3300V – 0XX, 1XX, 2XX, 3XX
024-26521-	2300/4160V – 0XX, 1XX, 6XX, 7XX 3300V – 0XX, 1XX, 6XX, 7XX
024-26522-	2300/4160V – 0XX, 1XX, 6XX, 7XX 3300V – 0XX, 1XX, 6XX, 7XX
024-27800-	2300/4160V – 4XX, 5XX, 8XX, 9XX 3300V – 4XX, 5XX, 8XX, 9XX
024-27801 -& 024-34021-	2300/4160V – 4XX, 5XX, 8XX, 9XX 3300V – 4XX, 5XX, 8XX, 9XX

MOTOR EVALUATION FOR AFTERMARKET VSD APPLICATIONS

An aftermarket variable-speed drive (VSD) retrofit may be a consideration for existing YORK chillers that in some cases could be 20+ years old. Should we apply a new VSD to an existing chiller, and that chiller were to experience a major compressor or motor failure a short time later, the customer would be dissatisfied, and may even be inclined to blame the failure on the addition of the VSD. In a proactive effort to mitigate the inherent risk of such pre-existing aged equipment situations, we should make certain that the customer's chiller has been properly maintained, and is in good operating condition, prior to proposing a VSD retrofit.

Regarding motor condition, the following things should be checked at a minimum to assure that the existing motor is in good working condition and should continue to operate without difficulty for years ahead. There is no absolute formula or non-destructive test to determine if a given motor is healthy. However, positive answers to many of the questions raised below will provide better assurance of longevity, compared to having no knowledge of the motor's history, or worse yet - negative answers to these questions.

Maintenance

- Has the motor been under maintenance contract since startup? Who has been responsible for maintenance?
- Have motor bearings been re-lubricated on the prescribed interval (no greater than 1800 hours between lubrications), using the correct type and amount of grease or oil? Is there a log of maintenance history to support claims of re-lubrication?

Motor Condition Monitoring

- Has the motor been meg-ohm tested recently, and at regular intervals (at least once per year)? Is there a maintenance log of meg-ohm test-results? Does the motor presently test higher than 500 meg-ohms (at 1000V scale) from windings to ground and between windings?
- Has there been any recent vibration analysis performed on the motor? Is there any change to vibration trending over time since the motor was commissioned? We suggest vibration should be checked at least once per year.

If vibration analysis has not been performed, you can arrange to have the motor tested by contacting the Johnson Controls Predictive Diagnostic department at 800-524-1330, and selecting options 6, 1, 1, and 5 – to get to the diagnostic team.

http://publish.cg.na.jci.com:9085/publish/controls/us/eng/pd/header/home_page.html

Location

- Is the chiller located within 50 miles of a salt-water coastal area?
If so, does the motor contain space heaters that are wired and energized when the motor is not running?
- If not near a coastal location, does the equipment room take in 100% outside air for ventilation or have roll-up doors that expose the chiller to outdoor humidity for significant periods? If so, we again suggest that the motor should have internal space heaters to assure moisture does not condense inside the motor when not running.

The final determination for aftermarket VSD retrofit application is a local business decision made by the Service Branch.