

What is 3 Minutes of Motor Testing Worth to You?

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The Company

A motor distributor in the Netherlands provided a 17 Kilowatt, 400-Volt motor to a local hospital in 2015. The hospital rented a portable crane to install the motor onto the roof of the building. The motor is used to operate a fan that is mounted on the hospital's roof. In the spring of 2016, the motor suddenly stopped running, so the motor distributor was contacted for field service, troubleshooting, and on-site support.

The Challenge

The motor had been connected to a Variable Frequency Drive (VFD), and when the motor stopped running, the hospital's maintenance technician reset the VFD. The motor did start, but unfortunately, the VFD shut the motor down again. Next the technician performed an insulation-to-ground test and determined the motor winding was not shorted to ground. Using a DMM (Digital MultiMeter) he then measured phase resistance and learned the phases were not open. The motor testing tools the technician used pointed to a "good" motor; therefore, they decided to replace the VFD.

After the new VFD had been installed, the motor started up, but did not continue to run. Much to the technicians' chagrin, they were experiencing the same problem; which compelled the hospital's maintenance manager to contact the distributor who had supplied the hospital with the motor.

The responsive motor distributor, who has a service center and support staff, sent one of their technicians to the hospital to test the motor. The service center technician used a meg-ohm meter and Digital Multi-meter (DMM) to determine that the motor was not grounded and the phases were not open; which was no different from the previous test results. Since the motor still did not run, the decision was made to replace the motor.

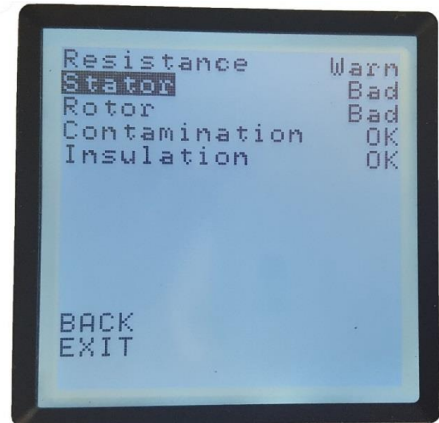
A crane was brought in to remove the motor from the roof of the hospital and allow a replacement motor to be installed. The replacement motor started and operated normally, confirming the new VFD was working as intended. The "suspect" motor was sent to the service center for a more thorough inspection.

The Solution – 3 Minutes of Motor Testing at the Service Center

An ALL-TEST PRO 5™ (pictured to the right) was used to perform a de-energized, non-destructive Motor Circuit Analysis (MCA) test at the service providers' facility. Motor Circuit Analysis evaluates the condition of the electric motor connections, stator, and rotor in just minutes.



Using the AT5™, connections were made to the three phases of the motor and a static test was performed. Next, the motor shaft was manually moved during the dynamic portion of the 3-phase test, and at the end of the test the instrument showed the results (as shown on the right).



When performing the dynamic test between phases 2-1, it became clear that this was the phase that had the problem.

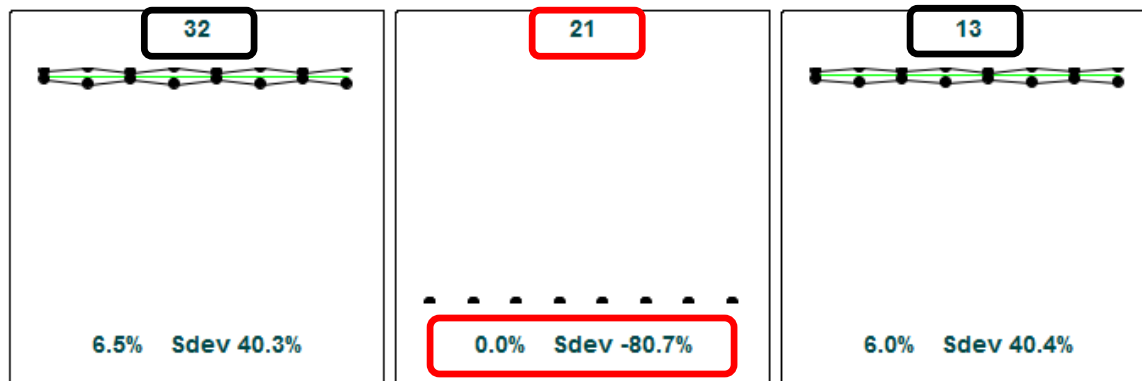


Figure 1. Stator and Rotor Signatures from the AT5 test report (phases listed at top of image)

Lessons Learned

Owners / Operators Can Reduce Maintenance Costs

A 17kW, 400V motor is not expensive, but when it is mounted on the roof of a building, and the owner has to rent a crane to lift that motor for installation and removal, the cost to the owner can become extremely expensive when it comes to maintenance and reliability. If the hospital's maintenance team had owned and utilized a Motor Circuit Analysis instrument such as the ALL-TEST PRO 5™ or ALL-TEST PRO 33

IND™, then they would have been able to tell right away that the motor had been the “bad actor” and not the VFD. Many hours were wasted by ordering and installing a new VFD when it had not been the true cause of the problem.

Distributors and Suppliers Can Improve Quality Assurance

Motor distributors and suppliers should implement an additional quality control measure prior to delivering new or off-the-shelf motors to their customers. Spending 3 minutes to check the condition of motors will help distributors and suppliers avoid warranty issues and increase customer satisfaction.

[Watch this video](#) to learn how motor testing can save you time, money, and headaches, or visit www.alltestpro.com for more information.

About ALL-TEST Pro LLC

Since 1985, ALL-TEST Pro, LLC has provided industry with the most advanced predictive maintenance testing and troubleshooting tools for AC and DC motors, coils, windings, transformers, generators and more to a wide range of industries worldwide. With a full line of testing instruments, software, accessories and training programs, ALL-TEST Pro has the tools you need to perform advanced non-destructive motor testing and analysis for both de-energized motor circuit analysis and energized electrical signature and power analysis. The extensive capabilities of the instruments, coupled with dependable post-sale training and technical support, ensure improved productivity, reduced downtime and a rapid return on investment.