

Isolating the Cause of a VFD Trip

Note 0601

Description

Motors powered by variable frequency (VFD) or variable speed (VSD) drives may require additional testing following a trip identified as a stator related anomaly. If the inner phase insulation is damaged or weak, the rapid voltage rise seen from many drives can result in inner phase currents sufficient to trip the drive. This application note is designed to give the analyst additional MCE test data, using the MCE for de-energized testing, to better isolate the cause of the trip to the drive or motor. It is applicable only for motors with >3 leads exposed at the connection box.

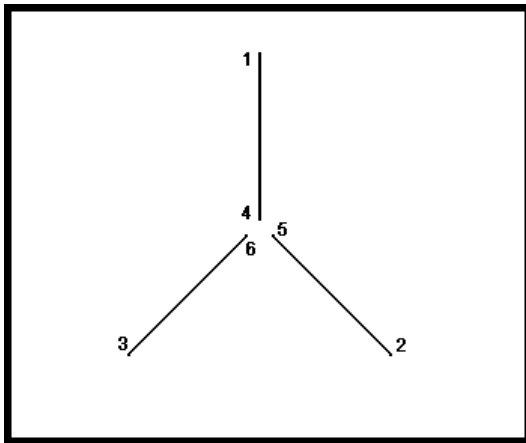


Figure 1

Procedures/Instructions

Six Lead

- Disconnect the VFD from the motor when performing MCE (de-energized) testing.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 2 and 3 together
- Connect Black (phase 1) MCE lead to motor lead 1. Connect green (ground) MCE lead to the connected motor leads 2 and 3.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 1 and 3 together.
- Connect Black (phase 1) MCE lead to motor lead 2. Connect green (ground) MCE lead to the connected motor leads 1 and 3.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 1 and 2 together.
- Connect Black (phase 1) MCE lead to motor lead 3. Connect green (ground) MCE lead to the connected motor leads 1 and 2.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.

Procedures/Instructions

Nine Lead

- Disconnect the VFD from the motor when performing MCE (de-energized) testing.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 2 and 3 together.
- Connect Black (phase 1) MCE lead to motor lead 1. Connect green (ground) MCE lead to the connected motor leads 2 and 3.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 1 and 3 together.
- Connect Black (phase 1) MCE lead to motor lead 2. Connect green (ground) MCE lead to the connected motor leads 1 and 3.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.
- Disconnect all motor leads from each other to isolate the phases.
- Connect motor leads 1 and 2 together.
- Connect Black (phase 1) MCE lead to motor lead 3. Connect green (ground) MCE lead to the connected motor leads 1 and 2.
- Perform a dielectric absorption test to determine the integrity of the inner phase insulation system.

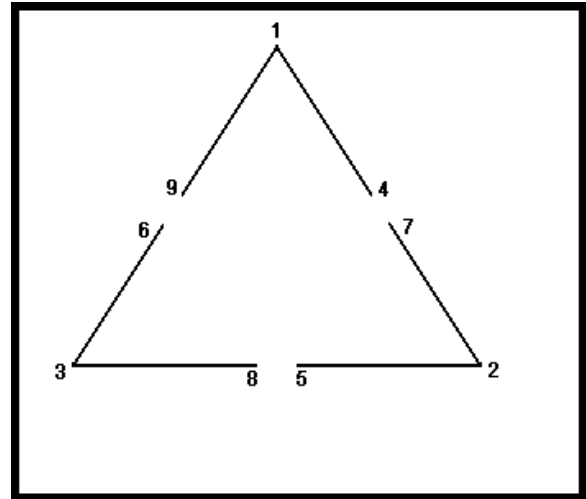


Figure 2

Summary

By charging the inner phase insulation system with a DC potential, weaknesses between phases can be identified as the root cause of the drive trip. Identifying the motor rather than the drive as the root cause can prevent costly drive replacements.