



# M2000 MOTOR WINDING FAULT SIMULATOR

The M2000 Fault Simulator is a 1/3 hp electric motor with four selectable winding faults. It is suggested that tests be performed on the Fault Simulator in the following sequence for the best possible display of the ALL-TEST™ capabilities.



1. With both switches in the **DOWN** position, the motor winding will test “balanced” during each test using the AT-3 or AT-4. However, 8 Megohms of resistance from winding to ground can be measured.

Note: Megohmmeters test only for ground resistance – not for inter-turn faults, and ohmmeters do not measure the “reactive” characteristics of the winding. The ALL-TEST™ incorporates *ALL TESTS!*

2. When switch 1 is **UP**, an “inter-turn short” is introduced which cannot be detected with any megohmmeter, multimeter, or micro-ohmmeter.. If possible, use these stand-alone devices first, then compare the results with the findings of the ALL-TEST™. Note: By industry standards, a 3% difference in resistance is acceptable unless other “reactive” type tests (Z, L, fi, I/F) coincide with the resistive imbalance. This is a motor fault in its very early stages. Detecting a fault like this can prevent a catastrophic failure.

NOTE: When a small difference is detected with the AT-3, try increasing the frequency to the next highest level, then retest.

3. With both switches now in the **UP** position, the fault is now increased to a “shorted coil” (several shorted turns). Not only are the windings unbalanced, but the I/F and Phase Angle are not within the range specified in the manual. Readings like these indicate a much more severe fault – one that may even prevent the motor from starting.
4. With the left switch **DOWN** and the right switch **UP**, a “reversed coil connection” is introduced. This is very common on new installations. The T-leads may not be properly marked, or the leads are simply connected improperly. In this case, the Inductance (L) is the only test result to change.
5. These tests may now be repeated on the single phase motor leads. The Phase Balance test is not applicable. However, the I/F and fi readings will be out of the normal test range. The capacitor will test “good”.

Note: Remember to re-zero the meter between phases when performing the Z-Test (I/F) and the Phase Angle test, but NOT the Phase Balance test (L). A slight difference of 1 to 2 percent between phases is normal for the M2000 and many other motors.

For more information:  
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**W A R N I N G !** Do not attempt to energize this motor with AC line voltage. The internal wiring and switches are not rated for line current. Serious injury and/or damage to the motor may result.