

MCA™ Improves DC Motor Testing Capabilities

The ALL-TEST PRO 7™ brings predictive maintenance to DC motor testing. Preventive Maintenance Tasks for DC motors such as commutator & brush inspections, lubrication, are very important for their long-term successful operation. However, these inspections fail to determine the condition of the electrical winding or insulation. Adding periodic electrical tests, such as measurements of the winding resistance and Insulation Resistance to Ground (IRG) provide some insight to possible connection issues & weaknesses in ground wall insulation, but still fail to determine the overall condition of the equipments insulation condition.



By adding MCA™ readings to DC motor testing provides early indication of developing problems within the motors electrical system beyond those detected using a megohm and ohm meter. MCA tests can be performed quickly from the drive and can confirm or eliminate faults in DC machines.

Several key points quickly determine the condition of DC Machines

1. Take Series winding and armature windings readings together
2. Test motors and generators the same
3. I/F reading outside of the range of -15 to -50 indicates a winding fault
4. An increase in temperature corrected winding resistance, accompanied by changes in impedance indicates loose connections
5. A decrease in temperature corrected resistance accompanied by changes in impedance, inductance, phase angle & current frequency response (I/F) indicates developing winding shorts
6. Deviations of phase angle or I/F of more than 2 points between like motors indicates the need for a MCA complete analysis
7. Changes in MCA reading in the armature circuit between test intervals prompts a bar to bar armature test
8. Changes in MCA readings in the armature circuit taken back to back indicates carbon build up in the armature

By following these simple guidelines using the AT7P™ provides early fault detection before the DC machine fails during operation. Recommended testing intervals should be at least those shown in Table 1.

Table 1: DC Motor Test Frequency

Test Type	Non-Critical	General	Critical
Preventive Maintenance	1 year	6-9 months	3-6 months
Predictive Maintenance	6 months	3 months	1 month
Armature Test	1 year	6 months	3 months

Once a developing fault is detected, it is recommended to reduce the time intervals between tests until the machine can be removed for repair. A complete armature test is recommended in conjunction with preventive maintenance tasks.

Conclusion

Preventive electrical testing of direct current machines is much easier using the DC mode function of the AT7P™. Step by step detailed easy to follow procedures are provided on the large backlit LCD display to make the testing quick and easy to perform from the motor drive in less than 5 minutes. Additional tests and features are available for troubleshooting at the motor to quickly pinpoint the source of the problem. MCA™ testing dramatically improves DC machine testing by saving time and providing more details as compared to traditional techniques and methods.