

ALL-TEST IV PRO™ 2000 Motor Circuit Analyzer and Advanced Analysis Kit

The Most Comprehensive Motor Circuit Analysis Package Available At Any Price!

- For Predictive Maintenance, Troubleshooting, and Quality Control
- Detects And Diagnoses Any Type Of Motor Electrical Fault.
- Analyzes Virtually All Motor and Wound Coil Types: DC, Single Phase AC, Three-Phase AC, Machine Tool Motors, Even Transformers and Coils.
- Suitable For Testing Virtually Any Size Winding.
- Measures And Compares Inductance, Impedance, Resistance, Phase Angle, Current/Frequency Response, and Insulation Resistance.
- Low Impact Tests Will Not Stress Windings.
- On-Board Memory Stores ID's And Test Data For Up To 500 Motors.
- RS-232 Interface And Software Provide A Permanent Record Plus Trending And Diagnostic Reports.



The ALL-TEST IV PRO 2000 is a motor circuit analyzer for trending and pinpointing both winding and rotor faults in all types of motors as well as coils. In use, the All-Test 4 is connected to each phase of a 3-phase motor, and sequentially performs and stores a series of measurements (inductance, impedance, resistance, phase angle, and current/frequency response). By comparing these measurements the user can detect and diagnose turn faults, coil faults, contaminated windings, poor connections, and a variety of other fault conditions.

The ALL-TEST IV PRO 2000 is fast and easy to use, with an auto test mode that is used for most testing. On-screen prompts step you through the test procedure from shorting the test leads (to measure and compensate for lead resistance) through a final insulation test. As each winding is connected, the instrument steps through the test sequence, displaying the results on all phases on the large graphic LCD. A complete 3-phase test sequence can be done in under a minute. A backlight can be turned on for work in poor light.

Measurements for up to 500 motors can be stored in the on-board memory and can be uploaded to a PC using the included TREND 2000 software. This provides have a permanent record of tests, and gives you the ability to create a database of all of your motors. View measurement trends to spot developing problems. Download previous measurements into the ALL-TEST IV PRO 2000, and compare new and old measurements as you test.

Test Submersible Pumps and Overhead Cranes In Place

Using the ALL-TEST, you can test through the power cable from 200 or more feet away (your control center for example). The ability to test motors without removal or climbing saves you time, money, and trouble. In addition, safety is improved by reducing your need to climb or enter confined spaces for maintenance.

Tool Machine Servos

Because of their configuration and application, tool machine servos represent a unique challenge in that the rotor cannot be moved when installed. For this reason, they cannot be reliably tested in place using inductance based tests. Because the ALL-TEST impedance-based tests and software are effective even when rotors cannot be adjusted, they are ideal for predictive maintenance testing of spindle and axis motors in CNC and similar machines. Detecting winding contamination and avoiding a single spindle motor rewind can more than justify the investment in an ALL-TEST IV!

DC Motor Testing

The ALL-TEST IV PRO 2000 can perform bar-to-bar testing of DC Armatures on both assembled and disassembled motors. Disassembled motors require the use of our ATF-11 Armature Test Fixture. Windings on both series and shunt motors can also be tested. On those motors with a single winding, readings are trended over time, or compared with a similar or "model" motor. For more details, request our application note on DC motor testing.



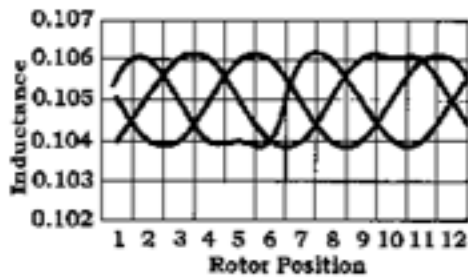
Transformer and Coil Testing

The ALL-TEST IV PRO 2000 may also be used for testing of transformers and coils. It has been effectively used by utilities and industrial facilities to test pad and pole mounted transformers as well as small instrument transformers. Turn and coil faults as well as winding contamination can be detected and quickly and easily. Due to the potential for large induced voltages and currents when testing, there are special procedures that must be followed. Request our application note on transformer testing for more information.

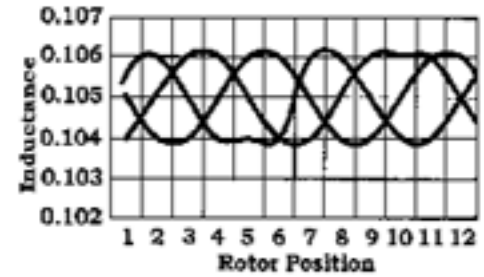
Rotor Testing

The ALL-TEST IV is an excellent tool for performing rotor tests. By recording and plotting 12 or more inductance measurements as the shaft is rotated, pattern variations can indicate a rotor problem without disassembling the motor. The following example is based on inductance readings using 12 test positions on a 200 HP motor. The rotor defect was determined to be either a casting void or a broken rotor bar, which was confirmed with vibration testing.

Good Rotor



Bad Rotor?



Advanced Analysis Kit Solves Rotor Position Issues

The rotor in a three-phase motor creates a natural phase unbalance in the windings, which can be seen in both impedance and inductance measurements. Rotor faults and winding contamination can also create phase unbalances. The Advanced Analysis Kit gives you the diagnostic power to identify the source of phase unbalances, and differentiate between faults, contamination, and rotor position issues. It combines the ALL-TEST IV PRO 2000, the ALL-TEST III, and Hal Junior diagnostic software. Here's how they work together.

The HAL Junior software analyzes and graphs ALL-TEST IV measurements, and provides the likely diagnosis of fault conditions (if any). It can differentiate between unbalances due to turn and coil faults, poor connections, winding contamination, and even rotor position. This diagnostic power is effective even in cases where the rotor cannot be adjusted.

In those cases where the rotor can be adjusted, the ALL-TEST III is used to adjust rotor position between measurements. This removes the effects of rotor position on impedance and inductance measurements, essentially "isolating" the stator and rotor electrically. This enables the most accurate fault pinpointing, and is especially important where rotor problems are suspected.



The Advanced Analysis kit includes the ALL-TEST IV Pro2000 analyzer, ALL-TEST III, manuals and guidebooks, leads, chargers, and cases, Trend 2000 software, Hal Junior software, an ATF-11 armature test fixture, an M2000 training motor, and a Motor Circuit Analysis reference book, Motor Circuit Analysis: Theory, Application and Energy Analysis by Dr. Howard W. Penrose, Ph.D.