

The Case for Continuity Testing with the HypotULTRA® III

Manufacturers of heating elements, cable harnesses, and aerospace cables must commonly perform point to point continuity tests and hipot tests as part of their routine production line tests. The linking of these continuity tests and hipot tests when test voltages exceed 1000 volts has previously only been available through custom test systems. Associated Research understood that some customers required a bench top style solution. To address this, a new 2000 Ohm continuity range was added for the HypotULTRA III. This enables point to point continuity tests and hipot tests at voltages up to 5,000 volts to be performed.

HypotULTRA III is unique in its ability to link point to point continuity tests with a hipot tests at voltages in excess of 1000 volts. There are many cable harness testers available on the market but they are limited in their Hipot test voltage. The HypotULTRA III is available in two models. The 7620 is an AC Hipot, and the 7650 is an AC/DC/IR tester. The HypotULTRA III has two separate Continuity test modes. The first test mode allows the operator to perform a simultaneous Ground Continuity Test with a 1 ohm maximum limit along with the Hipot test. This method of continuity testing is ideal for testing appliances and other products where the safety agency calls out for a basic continuity test to be performed on the safety ground circuit. The second test mode is the new 2000 Ohm continuity test mode. This mode can be selected as a separate test and point to point continuity tests can be performed through the optional 4 or 8 port internal scanner. The use of an internal scanner further automates the continuity test in that the measurement points can be changed via the scanner. This is ideal for multi-point continuity tests that are commonly required on cables and heating elements. The internal scanner outputs are conveniently located on the rear panel of the HypotULTRA III. A customer can choose either a internal scanner with 4 testing ports or one with 8 testing ports to be built into the HypotULTRA III. If additional testing ports are required, the HS-8A and the HS-16 external scanners also allow point to point continuity tests and hipot tests through the switching matrix. This will allow for an unlimited number of continuity tests to be performed.

How the 2000 Ohm Limit was Determined

A 2000 ohm limit was selected to meet the typical resistance range of the heating elements. A primary application for these continuity tests are heating element manufacturers. This is because it is very common for these manufacturers to routinely perform a continuity test on their products rather than an active run test. By performing a continuity test in place of a functional run test the operator doesn't have to wait for the element to heat up before measuring the input current or power, nor do they have to wait for the element to cool down so they can handle it, thus saving time. Operator safety is also a concern in performing a functional run test on the heating elements, the risk of being burnt or shocked is greatly reduced. Based upon the resistance measurement and the voltage rating of the element they determine the wattage of the device. The continuity test is also used to verify that the terminations are properly installed. The scanner allows the continuity test and the hipot test to be linked together without having to make

multiple connections to different pieces of test equipment.

Accessories Designed for Continuity Testing

Adapter Box P/N 38480

The HypotULTRA III is shipped with the standard adapter box P/N 36544, which connects to either the front or rear terminals on the standard instrument, allowing the operator to perform a continuity test on the ground conductor of an appliance at the same time that a hipot test is being conducted. An optional Universal Adapter Box P/N 38480, which is terminated in three HV leads all of which can be plugged into the HV scanner, is also available. The Adapter Box is connected to three channels on the scanner and the plug end of the cord set is connected to the adapter box while the other end of the cord set is connected to three other channels. The Line, Neutral, and Ground connections are checked by performing a three step point to point Continuity test through the scanner then a two step Hipot test is linked to the continuity test to hipot the Line to Neutral and Ground connections and the Neutral to Line and Ground connections. This accessory is ideal for Cord Set Manufacturers who are performing a continuity or polarization test on the cord sets as well as a hipot test.

AUTOWARE® Software S9870

With the introduction of the new automated HypotULTRA III came a new release of AUTOWARE S9870 that includes the software to control the HypotULTRA III and continuity through the internal and external scanners. Like our other versions of the Windows-based AUTOWARE control software, this program allows for RS-232 or GPIB interfaces and automated PC control to simplify the set-up of the test programs to eliminate operator error. The ASCII format allows import of the test data into any spreadsheet, word processing or database program. Autoware allows for a maximum of 208 testing ports.

This is just one of the many solutions Associated Research has developed based on the needs of a customer or an industry. Since 1936, we have led the way in developing the latest technology. The HypotULTRA III is truly unique in its capability to perform multiple continuity and hipot tests in a single instrument through a single DUT connection. Associated Research offers the most complete product line to meet the electrical safety testing needs of our customers. Call our toll free number 1-800-858-TEST (8378) and ask for a demonstration of our HypotULTRA III to find out for yourself.