



DIT-MCO TECHNICAL BULLETIN

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RDT

AC Hipot Testing

GENERAL INFORMATION

DIT-MCO test systems use an AC Dielectric Detector for AC hipot testing. MIL-STD-202, Method 301 defines the Dielectric Withstand voltage tests. The test determines whether the unit under test can operate safely at its rated voltage and withstand momentary overpotential. DIT-MCO's AC Dielectric Detector supplies AC stimulus and detects disruptive discharge "arcing" in the circuit under test. This unit provides pre-selected AC voltages from 500VAC to 1500VAC as applicable to the switching type in the system. The dielectric detector contains an ARC detection network that monitors the unit under test when applying test stimulus. This detection circuit has a capacitance compensation factor to look at the in-phase current only. Consequently, capacitance load variation up to 0.1 μf does not produce erroneous error indications.

The dielectric detector allows you to select between ramp mode operation or zero-crossing operation. The ramp mode ramps up voltage applied to the unit under test at 500 volts per second. When the test system has completed the ramp and the test is complete, the voltage is removed at the same rate. This is achieved using a variac. Consequently, test times are relatively slow. A zero crossing mode allows a more expedient test condition. During the first test with the zero crossing mode enabled, the voltage is ramped at 500 volts per second to the maximum programmed value. Subsequent to that first test, all other tests are applied at the zero crossing point on the AC sine wave. It is important to know that using either the ramping mode or the zero crossing mode, one never applies a high voltage to a capacitance load that results in transients. The voltage is always applied at a zero starting point or increased either by 500 volts per second or at the AC line frequency.

INPUT REQUIREMENTS

The AC Dielectric uses incoming line voltage (50 or 60 hertz) and a 1:17 transformer to provide the maximum voltage capability. Consequently, if line voltage excursions occur, the resultant output from the dielectric will vary at the 1:17 ratio. If the test conditions cannot tolerate a variation in the output detector, a line regulator is available. The line regulator takes the incoming, raw AC and produces a very highly regulated output. This reduces the effects of transitory (AC) line changes.

SAFETY

The AC Dielectric Detector provides up to 100 milliamps of power at 1500VAC. This is a lethal test voltage if personnel come in contact with the voltage. Consequently, extreme caution should be taken in using this system.

OPTION INFORMATION

The AC Dielectric Detector for 1500 volts is referred to as DD-II. The AC Dielectric Detector for 1000 volts is referred to as DD-I. They both provide a regulated source from the line. The dielectric detectors that do not have the regulator source are referred to as DD-IN and DD-IIN (N meaning non-regulated).