

**ESS D2006-4 03-Apr-2006****Use of Test Points for Verification**

The use of test points at electrical equipment is a viable method for reducing the hazards of electrical shock and arc-flash during the Lockout/Tagout verification step associated with achieving an electrically safe work condition. However, such use of test points must meet certain criteria as described hereafter.

- The test points shall be installed at a readily discernable position on the equipment
- Test points shall be provided for each incoming phase (ungrounded conductor)
- A test point shall be provided for ground
- A test point shall also be provided for the neutral (grounded conductor) of the power source if the neutral is utilized for current return
- The test points shall connect to the incoming phases of the equipment's power source at the equipment's incoming terminal point (line side) prior to any circuit breaker, fuse, switch or disconnecting means that is furnished with or part of the equipment
- The test points shall be guarded to avoid any reasonable possibility of electrical shock and of a design to accept the probes of common voltage measuring devices
- Series resistors shall be used to limit the available current to no more than 5 milliamps at the phase test points and to protect the wires to these test points for fault current
- These series resistors shall be located as close as practical to the incoming terminal point
- The wattage of these series resistors shall be sufficient to withstand a continuous fault at the test point as either phase-to-phase or phase-to-ground
- The values of the series resistors shall be indicated at the phase test points as they may affect the accuracy of the voltage detector utilized

Valid use of the test points as described for verification purposes requires the following procedure.

- Use an adequately rated voltage detector
- Before the equipment is isolated from the electrical power source, test the voltage detector at each incoming phase test point. (This test assures proper operation of the voltage detector and the integrity of the test point circuitry.)
- Best practice would include witnessing the removal of electrical energy with the voltage detector upon opening of the isolation device external to the equipment
- After isolation, use the voltage detector and test points to test that power has been isolated by testing phase-to-phase and phase-to-ground for the absence of voltage, thereby assuring that the electrical power source has been removed
- For equipment powered by only one phase or if the neutral is utilized for current return, also test phase to neutral for the absence of voltage
- After the testing activity, the voltage detector must be functionally tested to insure that it is working correctly.