



UL Requirements for Dielectric Voltage Withstand Test Equipment Used for UL/C-UL/ULC Mark Follow-Up Services

UL defines minimum requirements for dielectric voltage withstand test equipment used for tests required as part of the UL Follow-Up Services.

This document applies to all customers of UL's product certification services for the U.S. and Canadian markets, i.e., UL/C-UL/ULC Mark certifications.

Why this requirement is important

A key element in determining compliance with UL requirements is the validity and accuracy of inspection, measurement and test results. Dielectric voltage withstand test equipment used to test the electrical insulation of UL certified product must be technically capable for the purpose and also calibrated to provide the necessary level of confidence in the test results.

REQUIREMENTS

1. Minimum technical features for dielectric test equipment

All dielectric voltage withstand test equipment used to verify compliance with UL requirements as required as part of a UL Follow-Up Services shall:

- A. Incorporate either a visible or audible means to the operator that indicates an electrical insulation breakdown in the device under test,
- B. Be either manually resettable to restore operation of the test equipment after indication of electrical breakdown, or have an automatic feature that rejects any nonconforming device under test,
- C. Include a voltmeter in the output (test) circuit to indicate the test potential directly if the output of the test equipment transformer is less than 500 volt-amperes, or

- D. If the output of the test-equipment transformer is 500 volt-amperes or more, the test potential may be indicated (1) by a voltmeter in the primary circuit or in a tertiary-winding circuit, (2) by a selector switch marked to indicate the test potential, or (3), in the case of equipment having a single test-potential output, by a marking in a readily visible location to indicate the test potential. When a marking is used to indicate the test potential without an indicating voltmeter, the equipment shall include a positive means, such as an indicator lamp, to indicate that the manually resettable device has been reset following a dielectric breakdown.

Manufacturer's responsibilities for compliance with UL requirements

Manufacturers are responsible for selecting dielectric voltage withstand test equipment that is compliant with the above requirements. Certain Follow-Up Services Procedures may contain requirements for dielectric voltage withstand test equipment that are more specific than these, such as a particular test equipment model number. In such cases, either set of requirements may be applied to determine suitability of the equipment.

Additionally, manufacturers are responsible to ensure that all dielectric voltage withstand test equipment used to test UL certified product is calibrated in accordance with UL's published calibration requirements. Please see "UL Calibration Requirements: Equipment Used for UL/C-UL/ULC Mark Follow-Up Services" at ul.com/fus for more information.

2. Supplemental requirements

Some Follow-Up Services Procedures may include requirements test equipment for sensitivity checks each year.

Manufacturer's responsibilities for compliance with sensitivity requirements

- A. The required resistor shall be provided by the manufacturer and shall have a resistance found to be equal to or greater than 120,000 ohms. In order to comply with this requirement, the manufacturer has different options:
- Use a 120,000 ohm resistor verified with a calibrated ohmmeter,
 - Use a calibrated 120,000 ohm resistor, or
 - The calibration certificate for the dielectric voltage withstand test equipment clearly indicates that it meets the sensitivity criteria cited in 2b).
- B. When applying the required test voltage to the resistor, the test equipment shall indicate a breakdown almost instantly (in case of doubt breakdown within 0.5 seconds shall be verified) when the test equipment trip current is set at or less than the required test voltage (V) divided by 120,000 ohms.

3. Output frequency

Calibrated dielectric voltage withstand test equipment may supply the required test voltage at any output alternating current frequency within the range of 40 to 70 Hz.

Questions and responses

Please contact your UL field engineer with requests for additional information or clarification of these requirements.

For more information, please contact your local UL Field Engineer.