

STANDARD INFORMATION

Amendment 1: See updated Effective Date in RED below.

Standard Number: UL 943B

Standard Name: Appliance Leakage-Current Interrupters

Standard Edition and Issue Date: 2nd Edition Dated August 17, 2011

Date of Revision: October 26, 2017

Date of Previous Revision of Standard: September 16, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: ~~February 14, 2020~~ **May 14, 2021**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revise requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

Overview of Changes: Specific details of new/revise requirements are found in table below.

- Auto-monitoring function that allows for periodic, automatic testing of the ability of the device to respond to a ground fault.
- Auto-monitoring function test, performance testing to evaluate.

Specific details of new/revise requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revise paragraphs noted in the attached or explain why these new/revise requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.



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CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</i>
19A		<i>New section added;</i> Auto-Monitoring Function
19A.1		In addition to the Supervisory Circuit specified in Section 19, a resettable appliance leakage-current interrupter (ALCI) shall be provided with an auto-monitoring function that will allow for periodic, automatic testing of the ability of the device to respond to a ground fault. This testing shall be done without opening the circuit interrupter contacts.
19A.2		The auto-monitoring function shall perform the automatic test each time power becomes available to the line terminals. The automatic test shall be initiated within five seconds of power applied to the line terminals. The automatic test shall be repeated at least every 15 minutes.
19A.3		The auto-monitoring function shall not compromise the ability of the ALCI to respond to a ground fault. Compliance is determined by the requirements in Auto-Monitoring Function Test, Section 41A1.
19A.4		The consequence of the auto-monitoring test detection of a problem shall be one of the following: a) Power denial (trip with the inability to reset). Power denial shall occur within five seconds of an auto monitoring cycle failure. b) Power denial with the ability to reset, subject to an auto-monitoring test cycle within five seconds of the reset. Power denial shall occur within five seconds of an auto monitoring cycle failure.
41A1		<i>New section added;</i> Auto-Monitoring Function Test
41A1.1		The auto-monitoring function shall comply with the requirements of Auto-Monitoring Function, Section 19A.
41A1.2		In order to determine compliance with the provisions of Auto-Monitoring Function, Section 19A, separate representative devices shall be modified to represent those single component failure modes that can cause the ALCI to become unable to respond to a ground fault per this standard. Welded power contacts need not be considered. Each representative device shall be altered with a single modification that represents either an open or a shorted component as described in the following:



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- a) Open circuit or short circuit the ground fault sensing component (transformer).
 - b) Alter the integrated circuit responsible for the ground fault detection by one of the following modifications if appropriate per the application circuit:
 - 1) Disconnect the power supply pin of the IC;
 - 2) Disable the “clock” circuit or “phase zero cross” pin of the IC;
 - 3) Open the ground fault sensing signal path at the subject IC pin;
 - 4) Short the ground fault sensing signal path pin to one of the adjacent pins one at a time.
 - c) Open circuit the current limiter (for example, dropping resistor) of the power supply of the ground fault detection circuit.
 - d) Open circuit the trip solenoid. See 41A1.7.
 - e) Open the switching semiconductor supplying the trip solenoid. See 41A1.7.
 - f) Short circuit the switching semiconductor supplying the trip solenoid or relay (that is, short the anode and cathode of the semiconductor device).
 - g) Open circuit or short circuit a single rectifier diode in the ground fault detection power supply circuit. Short circuit a single diode in the case of a bridge rectifier package.
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41A1.3 Certain failure modes in 19A.4 need not be tested if, based on an engineering analysis of the circuit, one or both of the following criteria are met. The results of the engineering analysis shall be agreeable to all parties concerned.

- a) The failure mode does not interfere with the ability of the ALCI to respond to a line to ground fault.
- b) The failure mode results in 19A.4 being met automatically, without assistance from the auto-monitoring function.

41A1.4 The device power contacts shall be in the closed position at the start of the test. Power shall be applied externally by closing a switch in the supply. Each ALCI shall comply with 19A.4 within the timing requirements of 19A.2.

41A1.5 Trip time during auto-monitoring. The trip time relationship per Table 28.1 shall continue to be met during an automatic test interval. One representative device shall be subjected to a limited high-resistance ground fault test in accordance with 41A1.6.

41A1.6 The High-Resistance Ground Fault Test, Section 28, shall be conducted with $R_b = 500$ Ohms, at room temperature and at rated line voltage. Preconditioning by humidity, surge, drop or leakage current tests is not required to be conducted. The ground fault shall be applied when the auto monitoring function is active. It shall be permissible for the auto-monitoring function to be altered such that the auto-monitoring signal is being applied in the normal manner but continuously in order to test the ALCI.

41A1.7 As an alternative to meeting the requirements described in 41A1.2 (d) and 41A1.2 (e), each representative ALCI shall be considered as meeting the requirements of 41A1.1 if one of the following conditions is met:

- a) The ALCI visually or audibly indicates if it does not interrupt the electric circuit to all loads; or
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b) The ALCI interrupts the electric circuit to all loads or does not permit power to be applied to any loads, each time the reset is operated when reset is attempted.

CUSTOMERS PLEASE NOTE: This Table and column “Verdict” can be used in determining how your current or future production is or will be in compliance with new/revised requirements.
