UL 943B

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Appliance Leakage-Current Interrupters

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UL Standard for Safety for Appliance Leakage-Current Interrupters, UL 943B

First Edition, Dated May 31, 2001

Revisions: This Standard contains revisions through and including March 23, 2006.

SUMMARY OF TOPICS:

These editorial revisions to UL 943B replace all references to UL 1020, the Standard for Thermal Cutoffs for Use in Electrical Appliances and Components, with reference to UL 60691, the Standard for Thermal-Links – Requirements and Application Guide. UL 1020 was withdrawn and superseded by UL 60691.

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Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revisions dated March 23, 2006 include a reprinted title page (page1) for this Standard.

The revisions dated March 23, 2006 editorially replace all references to UL 1020 with the reference to UL 60691.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: http://ulstandardsinfonet.ul.com/ulforeword.html

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New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if

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the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Recognition and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-3	February 8, 2006
4-5	January 4, 2002
6-7	February 8, 2006
8-10	May 31, 2001
11	January 4, 2002
12	May 31, 2001
13	January 4, 2002
14-23	May 31, 2001
24-24B	January 4, 2002
25-28	May 31, 2001
29-31	February 8, 2006
32-34	May 31, 2001
35	January 4, 2002
36-39	May 31, 2001
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(Title Page Reprinted: February 8, 2006)

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UL 943B

Standard for Appliance Leakage-Current Interrupters

First Edition

May 31, 2001

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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APPENDIX A

Standards for Components. A1

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INTRODUCTION

1 Scope

1.1 These requirements cover appliance leakage-current interrupters (ALCIs), intended for use only in 2- or 3- wire alternating-current circuits wherein one of the wires is grounded in accordance with the National Electrical Code, ANSI/NFPA 70. They are intended to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit. An ALCI trips when the current to ground reaches a value in the range of 4 – 6 mA.

1.2 These requirements cover 2-wire appliance leakage-current interrupters for use only in cord-connected appliances intended for connection to alternating-current circuits of 250 V or less. An additional ground conductor may be provided. They are not to be provided with a general-purpose outlet receptacle, cord-connector body, or similar devices. Devices complying with these requirements are acceptable for use as components in an end product where the acceptability of the combination is to be determined.

1.3 The acceptability of an appliance leakage-current interrupter in any particular application depends upon its ability to be used continuously under the conditions that prevail in actual service. Accordingly, for a particular application, an appliance leakage-current interrupter may be affected by the requirements for the equipment it is used in, and it may be necessary to additionally evaluate features or performance characteristics that are not specified in this standard.

1.4 This standard does not cover ground-fault circuit-interrupters, which are covered by the Standard for Ground-Fault Circuit-Interrupters, UL 943.

1.5 Deleted February 8, 2006

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2 Glossary

2.1 For the purpose of this standard, the following definitions shall apply:

2.2 ACCESSIBLE PART – A part so located that it can be contacted by a person, either directly or by means of a probe or tool.

2.3 AUTOMATIC RECLOSURE – Denotes the act of an appliance leakage-current interrupter resetting itself after having been tripped.

2.4 CORD CONNECTED – Denotes connection to a supply circuit by way of a flexible cord terminating in an attachment plug.

2.5 DOUBLE INSULATION – The insulation system resulting from a combination of functional and supplementary insulation.

2.6 ENCLOSURE – Any surface or surrounding structure intended to minimize access to energized parts or parts presenting real or potential risk of injury to persons.

2.7 ENERGIZED PART – A part at some potential with respect to another part, or to earth.

2.8 FUNCTIONAL INSULATION – The insulation necessary for the proper functioning of the device, and for basic protection against the risk of electric shock.

2.9 INDOOR USE – Use in an indoor location or where exposure to rain is not likely to occur.

2.10 GROUND FAULT – An unintentional electrical path between a part operating normally at some potential to ground, and ground.

2.11 LEAKAGE CURRENT – All currents including capacitively coupled currents which may be conveyed between energized parts of a circuit and ground or other parts.

2.12 ORDINARY TOOLS – Pliers, and flat-bladed and cross recessed-head (Phillips type) screwdrivers.

2.13 RATED CURRENT – The marked value of current.

2.14 RATED VOLTAGE – For devices with a marked voltage within the range of 110 – 125 V, the rated voltage is to be considered to be 120 V. For devices with an additional marked voltage within the range of 190 – 250 V, the rated voltage is considered to be 120/240 V.

2.15 REINFORCED INSULATION – An insulation providing protection against the risk of electrical shock that is equivalent to double insulation.

2.16 RISK OF ELECTRIC SHOCK – A risk of electric shock hazard is considered to exist at a part of an appliance leakage-current interrupter if:

a) There would be current of 6 mA or more in a resistance of 500 ohms connected between the part in question and the grounded supply conductor, and

b) The device would not operate to open the circuit to the 500-ohm resistor within the time allowed in 27.1.

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2.17 SUPPLEMENTARY INSULATION – An independent insulation provided in addition to the functional insulation to insure protection against the risk of electric shock in the event that functional insulation should fail.

2.18 TRIP – Automatic interruption by the appliance leakage-current interrupter of the electric circuit to the load.

3 Components

3.1 Except as indicated in 3.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used in the products covered by this standard.

3.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

3.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

4 Units of Measurement

4.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

5 References

5.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

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CONSTRUCTION

6 Mechanical Assembly

6.1 An appliance leakage-current interrupter shall be formed and assembled so that it will have the strength and rigidity necessary to resist abuses to which it is likely to be subjected, without producing or increasing a risk of fire, electric shock or injury to persons due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts, or other serious defects.

6.2 An appliance leakage-current interrupter shall have all parts reliably secured in place.

6.3 An appliance leakage-current interrupter shall be constructed so that it will not be necessary to open or remove the enclosure when used as intended.

6.4 Male contact devices such as plugs, provided with, or as an integral part of, an appliance leakage-current interrupter shall also comply with the applicable construction and performance requirements from the Standard for Attachment Plugs and Receptacles, UL 498.

6.5 Lampholders, switches, and other similar components shall be mounted securely and turning shall be restricted from turning by more than friction between surfaces. For example, the use of a lockwasher is acceptable to restrict the turning of a device having a single hole mounting means.

Exception No. 1: A lampholder of a type in which the lamp cannot be replaced, (such as a neon pilot or indicator light in which the lamp is sealed-in by a nonremovable jewel), is not be prohibited from turning if rotation cannot reduce spacings below the minimum acceptable values or produce stress on a connector.

Exception No. 2: A switch or other similar component shall be securely mounted and turning shall be minimized, unless the turning of such a component is part of the design of the unit and introduces no additional risk of fire or electrical shock, or both, such as reduced spacings below the minimum acceptable values or stress on a connection.

6.6 An indicator light shall be one in which the lamp is sealed-in, such as by a nonremovable jewel.

6.7 A switch shall be located within the unit enclosure in such a manner as not to be accessible or exposed to tampering, nor subject to damage during normal use. This requirement does not apply to the actuating means of a switch.

6.8 The maximum acceptable moment, center of gravity, dimensions, and weight of a direct plug-in unit shall comply with the requirements specified in items (a), (b), (c) and (d). See 6.9, 6.10 and Figure 6.1.

a) The quotient of WY/Z shall not exceed 48 ounces (1361 g).

b) The quotient of WY/S shall not exceed 48 ounces (1361 g).

c) The product of WX shall not exceed 80 ounce-inches (0.56 N·m).

d) The weight of a unit shall not exceed 28 ounces (794 g).

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6.9 Definitions for the symbols used in 6.8 are as follows:

a) W is the weight of the unit in ounces (g).

b) Y is the distance illustrated in Figure 6.1 in inches (mm).

c) Z is the lesser of the two distances, Z_1 or Z_2, as illustrated in Figure 6.1 in inches (mm).

d) S is the lesser of the two distances, S_1 or S_2, as illustrated in Figure 6.1 in inches (mm).

e) X is the greater of the two distances, X_1 or X_2, as illustrated in Figure 6.1 in inches (mm).

6.10 The moment and weight specified in 6.8 are to be determined as follows:

a) For units with an output cord, the cord is to be cut off at the enclosure, or at the strain-relief means if the strain-relief means is outside the enclosure.

b) For units with directly mounted accessories, the values are to be measured with the accessories in place.

6.11 When inserted in a parallel-blade duplex receptacle, any part of a unit, including output wiring, shall not interfere with full insertion of an attachment plug into the adjacent receptacle. See Figure 6.2.

Exception: A unit that renders the adjacent receptacle completely unusable in any one mounting position is considered to comply with this requirement.

6.12 A mounting tab shall not be provided with the unit.

6.13 The enclosure of an attachment plug-type ALCI shall be capable of being gripped for removal from the receptacle to which it is connected. Gripping means include detents on the enclosure, ribs, or other equivalent means to facilitate grasp and removal of the ALCI. The perimeter of the face section from which the blades project shall not be less than 5/16 inch (7.9 mm) from any point on either blade.

Revised 6.13 effective January 4, 2004

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Figure 6.1
Dimensions of a direct plug-in unit

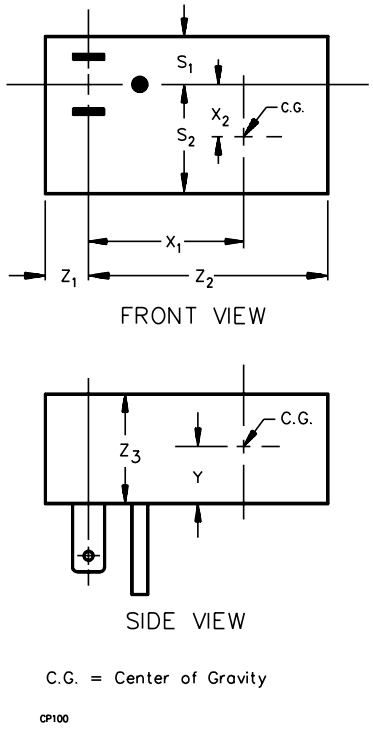
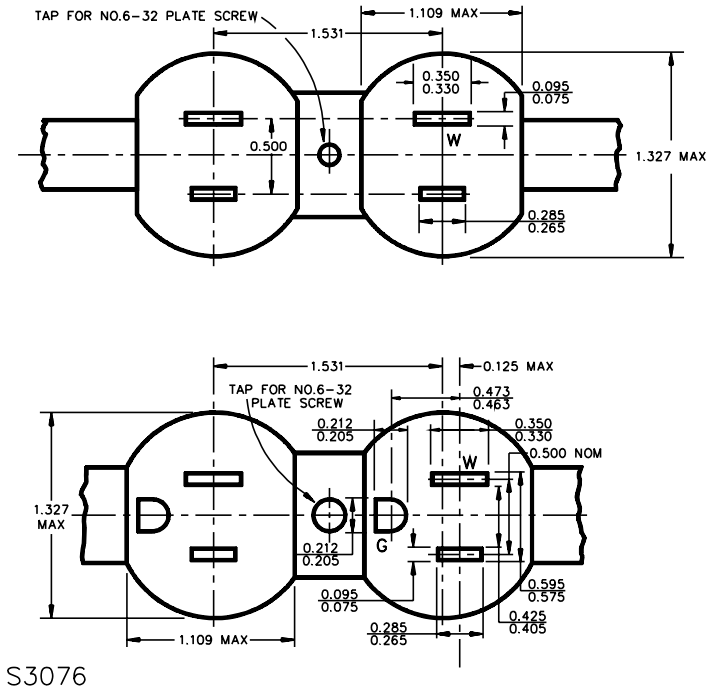


Figure 6.2
Parallel receptacle duplex
(All dimensions in inches)



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