

Underwriters Laboratories, Inc. (UL)
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Northbrook, IL 60062-2096

UL Standard for Safety
for
Outlet Circuit Testers and Similar Indicating Devices, UL 1436

Third Edition, Dated March 30, 1993

Revisions: This Standard contains revisions through and including October 2, 1996.

A change is indicated by a note following the affected item. The note is preceded and followed by an asterisk.

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October 2, 1996 – UL 1436

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2, 3	July 20, 1995
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UL 1436

Standard for

**Outlet Circuit Testers and Similar
Indicating Devices**

First Edition — May, 1978

Second Edition — August, 1981

Third Edition

March 30, 1993

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PERFORMANCE

11 General

11.1 The performance of an indicating device shall be investigated by subjecting the specified number of indicating devices to the tests shown in Table 11.1. The sequence shall be as shown even though some of the test sections in the Table may not be numbered consecutively.

Table 11.1
Test program for indicating devices

Outlet circuit testers and/or GFCI testers		
Set 1 ^a	Set 2 ^a	Set 3 ^{a,b}
Proper Operations ^c	Insulation Resistance, Section 13	Accelerated Aging, Section 12
Security of Blades, Section 14	Input, Section 16	Security of Blades, Section 14
Crushing, Section 15		
Drop, Section 17		
Proper Operations ^c		
Temperature, Section 18		

^a Each set shall consist of 3 representative samples of the outlet circuit tester or the GFCI tester. Each sample of the set is to be tested separately.

^b For devices with bodies of molded-rubber, polyvinyl chloride, or copolymer.

12 Accelerated Aging

12.1 Rubber compounds

12.1.1 A molded rubber body shall show no apparent deterioration and shall show no greater change in hardness than ten numbers after being tested as described in 12.1.2 and 12.1.3.

12.1.1 revised October 2, 1996

12.1.2 If possible, the molded rubber device is to be used complete. The hardness of the rubber is to be determined as the average of five readings with an appropriate gauge such as the Rex Hardness Gauge or the Shore Durometer. The device is then to be placed for 70 hours in a full-draft circulating-air oven at a temperature of $100 \pm 2^\circ\text{C}$ ($212 \pm 3.6^\circ\text{C}$). The device is to be at room temperature for four or more hours after removal from the oven. The hardness is to be determined again as the average of five readings. The difference between the average original hardness reading and the average reading taken after oven aging is the change in hardness.

12.1.2 revised October 2, 1996

12.1.3 The accelerated aging test mentioned in 12.1.1 and 12.1.2 is to be made on samples of each color of rubber and on samples of each basic rubber compound employed for the device.

12.1.3 revised October 2, 1996

12.2 PVC compounds

12.2.1 A device having a body of molded polyvinyl chloride or a copolymer thereof shall show no cracks, discoloration, or other signs of deterioration as the result of exposure for 96 hours in a full-draft circulating-air oven at a temperature of $100.0 \pm 1.0^\circ\text{C}$ ($212.0 \pm 1.8^\circ\text{F}$).

13 Insulation Resistance

13.1 When determined as described in 13.3 — 13.6, the insulation resistance shall not be lower than 100 megohms between:

- a) Live parts and any surface of insulating material that is exposed to contact by persons or that may be in contact with the ground in service,
- b) Live parts and dead metal parts that are exposed to contact by persons or that may be grounded in service, and
- c) Live parts of opposite polarity with the indicator circuit disconnected.

13.2 This test is to be made on rubber and similar materials of any color. Other materials are to be tested if they contain sufficient free carbon to color the material grey or black.

13.3 In determining compliance with the requirements in 13.1, the insulation resistance is to be measured by a magnetomegometer with an open-circuit output of 500 V or by equivalent equipment.

13.4 In measuring insulation resistance to the surface of an insulating material, it is necessary to apply an electrode to insulating material as described in 13.5.

13.5 A quantity of No. 7 lead drop shot (approximate diameter 0.10 inch or 2.5 mm) is to be placed in a container that is open at the top. After other openings through which the shot could enter have been plugged carefully with a high resistance insulating material, the device is to be immersed so that the shot serves as an electrode and contacts the surface to which the test is to be applied.

13.6 All rubber parts are to be kept for at least 48 hours at room temperature before being subjected to the test mentioned in 13.3 — 13.5.

14 Security of Blades

14.1 The blades and grounding pin of a plug-in indicating device shall be capable of withstanding a direct pull of 20 lb (89 N) for 2 minutes without loosening or, if a soft (resilient) molded material is involved, without permanent displacement of 3/32 inch (2.4 mm) or more.

14.2 The device is to be supported on a horizontal steel plate with the blades, pins, or both projecting downward through a single hole sufficiently large just to enable the blades, pins, or both to pass through it. A 20 lb (9.1 kg) weight is to be supported by each blade or pin in succession. The measurement of any blade displacement is to be done 2 minutes after the removal of the weight.

15 Crushing

15.1 An indicating device shall be capable of withstanding for 1 minute a crushing force of 75 lb (334 N) applied to any surface at right angles to its major axis without cracking, breaking, or permanent deformation that could

- a) Expose live parts to unintentional contact, or
- b) Render the device incapable of performing its intended function.

15.2 Any testing equipment that can apply a steady force of 75 lb (334 N) to the device may be employed. The device is to be placed between two 1/2 inch (12.7 mm) or thicker parallel flat maple blocks. The force is to be applied gradually and held at 75 lb (334 N) for a period of 1 minute.

16 Input

16.1 A device that introduces a current into the grounding conductor of a permanently installed wiring system shall be so constructed that the current introduced shall not exceed 2 milliamperes.

Exception: A device intended to check the operation of a permanently installed ground fault circuit interrupter shall introduce not less than 6 milliamperes or not more than 9 milliamperes into the grounding conductor of a permanently installed wiring system. The introduction of this test current shall be initiated by activating the test button of the GFCI tester. Three devices shall be subjected to the Ground Current Measurement Test indicated in 20.1.

16.2 To determine compliance with 16.1, the device shall be tested at 120 V, and at the voltage within the range of 102 — 132 V that will introduce the greatest current into the grounding path.

17 Drop

17.1 After being subjected to the drop-impact described in 17.2 and 17.3, the enclosure of a device shall not develop any cracks or openings that would expose electrical parts.

17.2 Each of 3 samples shall be dropped 3 times from a height of 5 ft (1.52 m) to strike a hardwood surface.

17.3 The hardwood surface mentioned in 17.2 is to consist of a layer of nominal 1 inch (25 mm) tongue-and-groove oak flooring mounted on two layers of 3/4 inch (19 mm) thick plywood. The surface is to be a square, nominally 4 ft (1.2 m) on a side. The assembly is to rest on a concrete floor or the equivalent during the test.

18 Temperature

18.1 The operating temperature at any point shall not exceed the temperature limits shown in Table 18.1.



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July 20, 1995

Revision pages for

Standard for

Outlet Circuit Testers and Similar Indicating Devices

UL 1436, Third Edition

Attached to this transmittal notice is a revision of the Third edition of UL 1436.

A CHANGE ON A PAGE DATED JULY 20, 1995 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT EXCEPT FOR PARAGRAPHS 22.1 AND 22.1.1, WHICH BECOME EFFECTIVE JULY 20, 1996 AS INDICATED IN THE SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL JULY 20, 1996, DO NOT DISCARD THE PREVIOUS PAGES CONTAINING THE REQUIREMENTS SPECIFIED ABOVE UNTIL THIS FUTURE EFFECTIVE DATE.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this standard unless the applicant specifically requests that the product be judged under the current requirements. However, should the applicant elect this option, it should be noted that compliance with all the requirements in this standard will be required as a condition of continued Listing and Follow-Up Services after the effective date and understanding of this should be signified in writing.

The new and revised requirements are substantially in accordance with UL's bulletin on this subject dated January 18, 1995. The bulletin is now obsolete and may be discarded.

Revised and/or additional pages may be issued from time to time.

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FOREWORD

- A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.
- B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.
- C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.
- D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.
- E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.
- F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1 Scope

1.1 These requirements apply to outlet circuit testers, ground-fault circuit-interrupter testers, and similar indicating devices that are

- a) For use on 15- and 20-A, 3-wire, 125-V receptacles,
- b) Intended to be connected to the receptacle for a period of time only as long as is necessary to note the indicated pattern of lights or other similar indicating means, and
- c) Not intended to be a comprehensive instrument or to determine the quality of the circuit grounding.
- d) These requirements also apply to retention testers and other indicating devices with a retention testing capability (hereafter referred to as retention testers) that are intended to indicate the force exerted on the blade or blades of the tester by the contacts of a receptacle.

1.1 revised July 20, 1995

1.2 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this Standard, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this Standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this Standard cannot be judged to comply with this Standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this Standard.

1.2 revised July 20, 1995

2 Glossary

2.1 For the purposes of this standard the following definitions apply.

2.1 revised and previous text relocated as 2.1.1 July 20, 1995

2.1.1 GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) TESTER – A device with no receptacle outlet that, when plugged into a receptacle and activated, circulates current through the ungrounded circuit conductor, and the grounding conductor and then indicates by a pattern of lights, or other similar means, whether a GFCI connected to the branch circuit is functioning. A GFCI tester may also include the provisions of an Outlet Circuit Tester. See 2.2.

2.1.1 added July 20, 1995

2.2 OUTLET CIRCUIT TESTER – A device with no receptacle outlets that, when inserted into a receptacle, indicates by a pattern of lights, or other similar means, the presence, or absence, of specific elementary wiring conditions. An outlet circuit tester may also incorporate the provisions of a retention tester.

2.2 revised July 20, 1995