UL 639

STANDARD FOR SAFETY

Intrusion-Detection Units

UL Standard for Safety for Intrusion-Detection Units, UL 639

Eighth Edition, Dated August 31, 2007

Summary of Topics

This revision of ANSI/UL 639 dated June 18, 2024 includes changes to Battery Marking Requirements, 72.1.

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated May 17, 2024.

No Text on This Page

AUGUST 31, 2007
(Title Page Reprinted: June 18, 2024)

UL 639

Standard for Intrusion-Detection Units

First Edition – April, 1964
Second Edition – October, 1969
Third Edition – December, 1971
Fourth Edition – September, 1978
Fifth Edition – September, 1986
Sixth Edition – July, 1993
Seventh Edition – February, 1997

Eighth Edition

August 31, 2007

This ANSI/UL Standard for Safety consists of the Eighth Edition including revisions through June 18, 2024.

The most recent designation of ANSI/UL 639 as an American National Standard (ANSI) occurred on June 18, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at https://csds.ul.com.

No Text on This Page

CONTENTS

INTRODUCTION

CONSTRUCTION – ALL UNITS

ASSEMBLY

FIELD WIRING

INTERNAL WIRING

ELECTRICAL COMPONENTS

SPACINGS

PERFORMANCE – ALL UNITS

MARKING

ACCESSORY EQUIPMENT

APPENDIX A

INTRODUCTION

1 Scope

1.1 These requirements cover intrusion-detection units intended to be used in burglary-protection signaling systems. These units are intended to be used in indoor or outdoor locations to automatically indicate the presence of an intruder by actuating electrical control circuits.

1.2 An intrusion detector, as covered by these requirements, consists of one or more unit assemblies of electrical components that are designed to detect the presence, movement, sound or other activity of an intruder. Provision is made for connection to the assembly of power supply, remote control, and signal circuits by a prescribed method of wiring.

1.3 Intrusion-detection units covered by these requirements are intended to be installed in accordance with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681.

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, 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 used in the products covered by this standard.

2.1.2 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.

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

2.1.4 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.

2.2 Units of measurement

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

2.2.2 Unless otherwise indicated, all voltage and current values mentioned in this standard are root-mean-square (rms).

2.3 Undated references

2.3.1 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.

2.4 Terminology

2.4.1 The term "product" as used in these requirements refers to all types of household burglar-alarm system units.

2.4.2 Unless otherwise indicated, all voltage and current values in this standard are rms.

3 Glossary

3.1 For the purpose of these requirements, the following definitions apply.

3.2 CIRCUITS, ELECTRICAL –

a) High-Voltage (Class 1) – A circuit involving a potential of not more than 600 volts and having circuit characteristics in excess of those of a low-voltage power-limited circuit.

b) Low-Voltage – A circuit involving a potential of not more than 30 volts AC rms, 42.4 volts peak or direct current (DC).

c) Power-Limited – A circuit wherein the power and current are limited as specified in Power-Limited Circuits, Section 26.

d) Class 2 – A circuit in which the voltage and power limitations are in accordance with the requirements of Table 26.1 for AC circuits and Table 26.2 for DC circuits.

e) Class 3 – A circuit in which the voltage and power limitations are in accordance with the requirements of Table 26.1 for AC circuits and Table 26.2 for DC circuits.

3.3 CORD-CONNECTED UNIT – A unit intended for connection to the power source by means of a supply cord. Such a unit is intended to be moved for reasons of interchange or realignment of the units of a system.

3.4 FIXED EQUIPMENT – A product intended to be permanently connected electrically.

3.5 LINE VOLTAGE – The voltage at any field-connected source of supply, nominally 50 – 60 hertz; 115, 208, or 230 volts.

3.6 PORTABLE EQUIPMENT – A cord- and plug-connected product that is capable of being carried or moved about.

3.7 PRIMARY BATTERY – A battery that is not intended to be recharged.

3.8 RADIO FREQUENCY – All frequencies above 20 kilohertz.

3.9 SAFETY CIRCUIT – Any circuit that is relied upon to reduce the risk of fire, electric shock, or unintentional contact with moving parts that may cause injury to persons (an interlock circuit, for example).

3.10 SECONDARY BATTERY – A battery that is intended to be recharged.

3.11 STANDBY CONDITION – The ready-to-operate condition of the product existing prior to being tripped or operated by an intrusion.

3.12 STATIONARY EQUIPMENT – A cord- and plug-connected product that is intended to be fastened in place or located in a dedicated space.

4 Installation and Operating Instructions

4.1 A copy of the installation and operating instructions intended to accompany the product, related schematic wiring diagrams, and installation drawings is to be furnished with the sample submitted for investigation and is to be used as a guide in the examination and test of the product. For this purpose, a final printed edition is not required. The information may be included in a manual.

4.2 The installation and operating instructions shall include such directions and information necessary to accomplish the intended installation, maintenance, and operation of the product and in accordance with the required information of Section 74 (Instructions and Drawings).

4.3 The installation and operating instructions containing the information required in 4.1 and 4.2 and as referenced in other paragraphs in this standard, shall be made available by one or more of the following means:

a) Printed hardcopy format;

b) Instructions attached to the product;

c) Electronic instructions within the basic product software; or

d) Electronic media such as CD, DVD, thumb drive, website, or equivalent.

4.4 When the installation and operating instructions are included as described in 4.3 (a), (c), or (d), they shall be referenced in the product marking by document number and issue date, and/or revision level. Products utilizing electronic media as described in 4.3 (c) or (d), shall include information on how to receive a printed copy of the installation and operating instructions.

CONSTRUCTION – ALL UNITS

ASSEMBLY

5 General

5.1 Unless specifically indicated otherwise, the construction requirements specified for a product shall also apply for any remote accessories with which it is to be employed.

6 Test Features

6.1 If provision is made for testing the operability, battery condition, or proximity to alarm of an intrusion-detection unit, the means provided shall be durable, practical, and shall not result in a risk of injury to the personnel involved.

6.2 The test means shall be constructed and located so that unauthorized personnel can not defeat the system.

6.3 The requirements specified in 6.1 and 6.2 do not apply to a photoelectric unit.

7 Enclosure

7.1 General

7.1.1 The frame and enclosure of the product shall have the strength and rigidity to resist total or partial collapse, with the attendant reduction of spacings, loosening or displacement of parts, or other defects. See the Mechanical Strength Tests for Enclosures, Section 54.

7.1.2 An electrical part of a product shall be located or enclosed to provide protection against unintentional contact with uninsulated high-voltage live parts.

7.1.3 An operating part, such as a gear mechanism, light-duty relay, or similar device, shall be enclosed to reduce the risk of malfunction from dust or from other material that may impair its intended operation. See the Dust Test, Section 58.

7.1.4 The mounting means of an enclosure shall be accessible without disassembly of any operating part of the product. Removal of a completely assembled panel to mount the enclosure is not considered to be disassembly of an operating part.

7.1.5 An enclosure for other than power-limited circuits shall be constructed to reduce the risk of emission of flame, molten metal, flaming or glowing particles, or flaming drops. See the Abnormal Operation Test, Section 44, and the Ignition Through Bottom-Panel Openings Test, Section 53.

7.1.6 The requirement in 7.1.5 necessitates either a nonflammable bottom in accordance with 7.1.11, or a protective barrier as described in Figure 7.1 under all areas containing flammable materials.

Exception: See 7.1.12.

7.1.7 A construction using individual barriers under a component or group of components or assemblies, as specified in Figure 7.1 is to be considered as complying with the requirement in 7.1.5.

7.1.8 An opening directly over an uninsulated high-voltage live part shall not exceed 0.187 inch (4.75 mm) in any dimension unless the configuration is such that direct entry to uninsulated high-voltage live parts is prevented. See Figure 7.2 for examples of top cover designs and Figure 7.3 for side openings that may be used to prevent direct entry. See also 7.1.9.

7.1.9 An opening in the enclosure that will not permit entrance of a 1-inch (25.4-mm) diameter rod shall be sized and so arranged that a probe, as illustrated in Figure 7.4, cannot be made to contact any uninsulated live electrical part (other than low-voltage) when inserted through the opening in a straight or articulated position.

7.1.10 An opening that permits entrance of a 1-inch (25.4-mm) diameter rod may be used under the conditions described in Figure 7.5.

7.1.11 Openings may be provided in the bottom panels or protective pans under areas containing materials not classified as V-1, in accordance with the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94, if constructed in a manner that prevents materials from falling directly from the interior of the product onto the supporting surface or any other location under the product. Figure 7.6 illustrates a type of baffle that complies with this requirement. A second construction that complies with this requirement is a 0.040-inch (1.02-mm) sheet-steel bottom-panel in which are 5/64 inch (2.0-mm) maximum, round holes not closer together than 1/8 inch (3.2 mm) center-to-center. Constructions other than these two may be used if they comply with the Ignition Through Bottom-Panel Openings Test, Section 53.

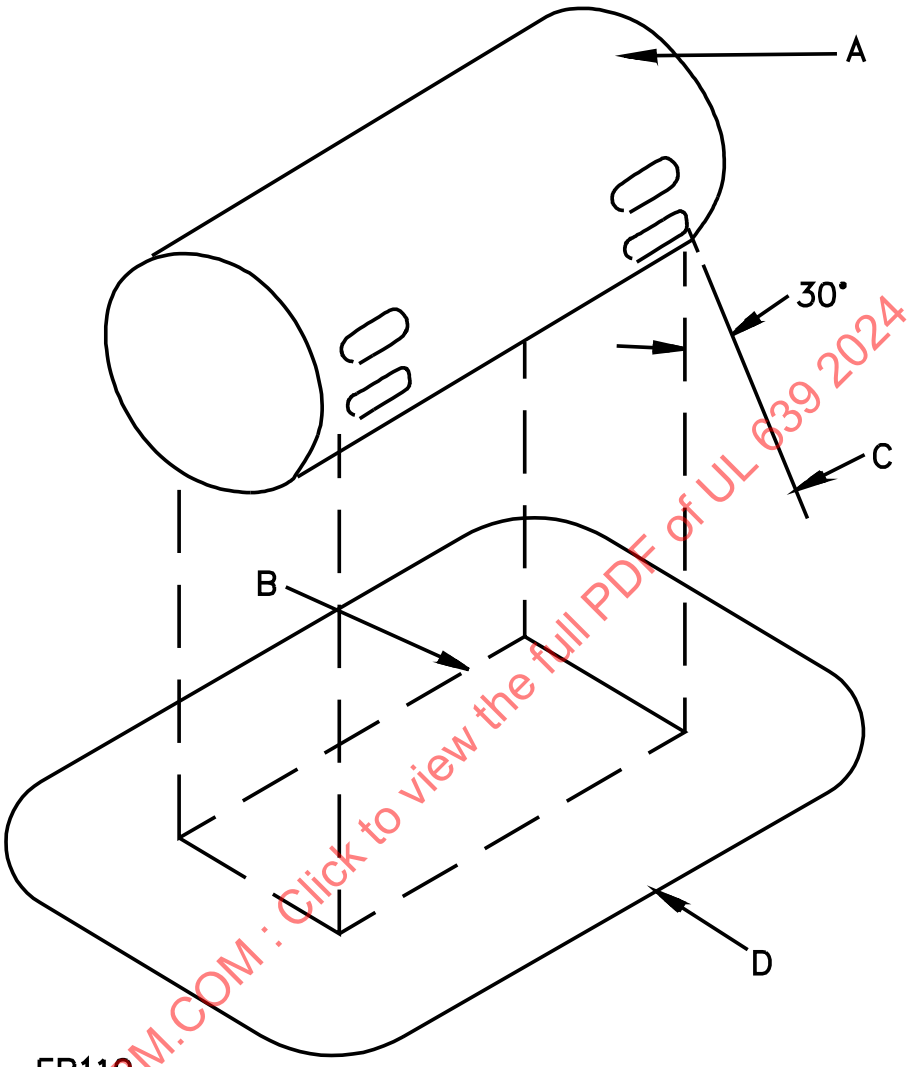
7.1.12 The bottom of the enclosure under areas containing only materials classified as V-1 or better may have openings not larger than 1/16 square inch (40.3 mm^2).

7.1.13 An opening, without limitation as to size or number of openings, may be used in areas containing only PVC, TFE, CTFE, FEP, and neoprene insulated wire cable, in areas containing plugs and receptacles, and in areas underneath impedance or thermally-protected motors.

7.1.14 An opening in the enclosure shall not give access to a relay, terminal, control, or related component that might be subject to tampering by hand or with hand tools, wires, hooks, and the like.

Figure 7.1

Protective barrier



NOTES

1) The entire component under which a barrier (flat or dished with or without a lip or other raised edge) of nonflammable material is to be provided. The sketch above is a metal enclosed component with ventilating openings to show that the protective barrier is required only for those openings from which flaming parts might come. If the component or assembly does not have its own nonflammable enclosure, the area to be protected would be the entire area occupied by the component or assembly.

2) Projection of the outline of the area of (A) which needs a bottom barrier vertically downward onto the horizontal plane of the lowest point on the outer edge (D) of the barrier.

3) Inclined line that traces out an area (D) on the horizontal plane of the barrier. Moving around the perimeter of the area (B) which needs a bottom barrier, this line projects at a 30-degree angle from the line extending vertically at every point around the perimeter of (A) and oriented to trace out the largest area, except that the angle may be less than 30 degrees if the barrier or portion of the bottom cover contacts a vertical barrier or side panel of nonflammable material, or if the horizontal extension of the barrier (B) to (D) would exceed 6 inches (152 mm).

4) Minimum outline of the barrier, except that the extension B – D need not exceed 6 inches (152 mm) (flat or dished with or without lip or other raised edge). The bottom of the barrier may be flat or formed in any manner provided that every point of area (D) is at or below the lowest point on the outer edge of the barrier.

Figure 7.2

Top panel louver designs