

UL 1238

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Control Equipment for Use with Flammable Liquid Dispensing Devices

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Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Control Equipment for Use with Flammable Liquid Dispensing Devices, UL 1238

Third Edition, Dated September 28, 2001

Revisions: This Standard contains revisions through and including May 25, 2007.

Summary of Topics

This Third Edition of ANSI/UL 1238 has been reinstated and includes a revised title page. No changes in requirements have been made. The Fourth Edition of UL 1238 has been withdrawn.

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The requirements are substantially in accordance with UL's Proposal(s) on this subject dated March 16, 2007.

The revisions dated May 25, 2007 include a reprinted title page (page1) for this Standard.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

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://ulstandardsinfo.net/ul.com/ulforeword.html>

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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

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 Listing, 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	May 25, 2007
4-5	September 28, 2001
6	May 25, 2007
7-52	September 28, 2001

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SEPTEMBER 28, 2001
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ANSI/UL 1238-2007

1

UL 1238

Standard for Control Equipment for Use with Flammable Liquid

Dispensing Devices

The fourth edition has been withdrawn and the third edition was reinstated, May 25, 2007.

First Edition – August, 1975
Second Edition – March, 1996
Fourth Edition – March, 2006

Third Edition

September 28, 2001

The most recent designation of ANSI/UL 1238 as an American National Standard (ANSI) occurred on May 25, 2007.

This ANSI/UL Standard for Safety, which consists of the Third Edition with revisions through May 25, 2007, is under continuous maintenance, whereby each revision is ANSI approved upon publication.

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. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover electrical equipment used for the control of flammable liquid dispensing devices rated 600 volts or less. Such control equipment is intended to be installed in ordinary locations in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements also cover electrical control equipment that is capable of being installed in or over a hazardous area as defined by the Flammable and Combustible Liquids Code, NFPA 30. Electrical control equipment for installation in a Class I, Division 1 or Division 2 hazardous area shall comply with the applicable requirements of the Standard for Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations, UL 886; and the Standard for Switches for Use in Hazardous (Classified) Locations, UL 894.

1.3 These requirements cover general-use field-installed equipment. They also cover controls intended to be factory installed on or in certain devices as operating controls. Typical devices covered by these requirements include:

- a) Communication Units – Visual, pulse, or audio devices which complies with the transmittal of data or information. Such devices include audio or visual systems between the service station attendant and the customer, and data processing systems between the service station and a remote data processing terminal.
- b) Control Consoles – Prepay, post-pay, remote totalizing, or remote actuating and monitoring devices located indoors or within a structure some distance from the dispensing device.
- c) Credit Acceptance Units – Dollar bill, coin, token, pulse, or credit card activated devices which are capable of being installed on, adjacent to, or away from the dispensing device.
- d) Electric Computer Resets – Electrically authorized or electrically operated devices which reset a mechanical computer.

1.4 These requirements do not cover safety or emergency controls which automatically or manually interrupt the operation of a dispensing device.

1.5 The term "device" refers to any equipment covered by this standard.

1.6 These requirements do not cover purely mechanical systems such as hose nozzle attachments and pneumatic or hydraulic actuators.

1.7 Deleted September 28, 2001.

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.

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.

2.1.5 Except for portable equipment, provision shall be made for securely mounting control equipment in position. Bolts, screws, or other parts used for mounting equipment shall be independent of those used for securing components of the equipment to the frame, base, or panel.

2.2 Units of measurement

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

2.2.1 revised September 28, 2001

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

3 Glossary

3.1 For the purpose of this standard, the following terms apply.

3.2 ABBREVIATIONS – For the purpose of this standard, the following definitions apply:

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AC – Alternating Current

AWG – American Wire Gage

DC – Direct Current

GSG – Galvanized Sheet Gage

Hz – hertz

MSG – Manufacturers Standard Gage

NEC – National Electrical Code, ANSI/NFPA 70

psig – Pounds per square inch gauge

rms – Root-mean-square

3.3 BRANCH CIRCUIT – That portion of the building wiring system beyond the final overcurrent device on the power-distribution panel protecting the circuit to the field-wiring terminals in a permanently connected device or to the receptacle outlet for cord-connected devices.

3.4 CIRCUITS, ELECTRICAL –

a) Class 2 (Low-Voltage) – A circuit involving a potential of not more than 42.4 volts peak supplied by:

- 1) An energy-limiting Class 2 transformer;
- 2) A nonenergy-limiting Class 2 transformer and an overcurrent protective device that has been evaluated for limiting energy to Class 2 levels;
- 3) The combination of an isolated transformer secondary winding and a fixed impedance or reliable regulating network which complies with the applicable performance requirements for an energy-limiting Class 2 transformer;
- 4) A dry cell battery having output characteristics no greater than those of an energy-limiting Class 2 transformer; or
- 5) The combination of a rechargeable battery and a fixed impedance or reliable regulating network which complies with the applicable performance requirements for an energy-limiting Class 2 transformer.

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b) Line-Voltage – Any field connected source of supply other than battery power, nominally 50 – 60 Hz, 115, 208, or 230 volts, is classified as a line-voltage circuit.

c) Secondary – Those circuits supplied from transformer output windings which are electrically isolated, i.e., insulated from ground.

3.5 CORD- AND PLUG-CONNECTED DEVICE – A device intended for connection to the branch-circuit power line by means of a supply cord. Such a device is intended to be moved for reasons of interchange or servicing.

3.6 GENERAL PURPOSE ENCLOSURE – A metallic or nonmetallic enclosure that is not required to be explosion proof.

4 Instructions

4.1 A copy of the operating and installation instructions intended to accompany each device, or equivalent information, is to be used as a reference in the examination and test of the device. For this purpose, a printed edition is not required.

4.2 The instructions shall include such directions and information as deemed by the manufacturer to be adequate for the proper installation, maintenance, and use of the device.

CONSTRUCTION

5 Frame and Enclosure

5.1 General

5.1.1 Control equipment shall be so formed and assembled that it has the strength and rigidity required to resist the abuses to which it is capable of being subjected, without increasing its fire hazard due to total or partial collapse resulting in reduction of spacings, loosening or displacement of parts, or other serious defects.

5.1.2 The equipment shall be provided with an enclosure of material evaluated for use in this application which shall house all electrical parts that are capable of presenting a risk of fire, electric shock, or injury to persons under any condition of use.

5.1.3 A portion of an overall enclosure can be omitted when the equipment is intended to be installed in conjunction with other equipment where the latter completes the enclosure, and installation instructions are provided.

5.1.4 Among the factors taken into consideration when an enclosure is being evaluated are its:

- a) Physical strength,
- b) Resistance to impact,
- c) Moisture absorptive properties,
- d) Flammability,
- e) Resistance to corrosion.

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- f) Resistance to distortion at temperatures to which the enclosure is capable of being subjected under conditions of normal or abnormal use,
- g) Resistance to solvents, and
- h) Resistance to the generation of dangerous static charges.

5.2 Covers

5.2.1 An enclosure and a part of an enclosure such as a door, cover, or similar parts shall be provided with means for firmly securing it in place.

5.2.2 Sheet-metal screws threading directly into metal shall not be used to attach a cover, door, or other part removed to install field wiring or for operation of the equipment. Sheet-metal screws can thread into sheet-metal nuts that are permanently mounted and suitably protected against corrosion. Machine screws and self-tapping machine screws can thread directly into sheet-metal walls.

5.2.3 Sheet-metal screws mounting internal components that are not removed for installation or operation can thread directly into metal.

5.2.4 A snap-on cover that gives access to exposed live parts and that does not require a tool for removal shall withstand the following tests:

- a) A cover that is capable of being removed with one hand shall not be released when a squeezing force of 14 pounds (62.3 N) is applied at any two points, the distance between which shall not exceed 5 inches (127 mm), as measured by a tape stretched tightly over that portion of the surface of the cover that is capable of being encompassed by the palm of the hand. The test shall be performed before and after ten removal and replacement operations.
- b) A cover shall not become disengaged from the case when a direct pull of 14 pounds (62.3 N) is applied. For this test, the cover is to be gripped at any two convenient points. The test shall be performed before and after ten removal and replacement operations.
- c) A cover shall withstand an impact force of 1 foot-pound (1.4 J) applied to accessible faces of the cover (one blow per face) without being displaced, and there shall not be damage to internal parts or malfunction of the control as a result of this test. The radius of the ball used for this test shall not be less than 1 inch (25.4 mm).

5.2.5 The continuity of the bonding means for a snap-on or fastener-attached cover shall comply with the requirements in 13.1.1 – 13.1.4, 13.2.1, and 13.2.2.

5.2.6 An enclosure cover shall be hinged when it gives access to a fuse, thermal cutout, or any other overload-protective device, the normal functioning of which requires renewal, or when it is required to open the cover in connection with the normal operation of the device.

5.2.7 A door or cover giving access to a fuse or thermal cutout in other than a low-voltage circuit shall shut closely against a 1/4 inch (6.4 mm) rabbet or strips that have been determined to be equivalent, or shall have either turned flanges for the full length of four edges or angle strips fastened to it. Flanges or angle strips shall fit closely with the outside of the walls of the box proper and shall overlap the edges of the box not less than 1/2 inch (12.7 mm). An appropriate construction that affords protection that has been determined to be equivalent or a combination of flange and rabbet is permissible.

5.2.8 Strips used to provide rabbets, or angle strips fastened to the edges of a door shall be secured at not less than two points, not more than 1-1/2 inches (38 mm) from each end of each strip and at points between these end fastenings not more than 6 inches (152 mm) apart.

5.2.9 A hinged cover shall be provided with a spring latch or catch, and not depend solely upon screws or other similar means requiring the use of a tool to hold it closed. For a hinged cover that is provided, although not required, a hasp, sliding latch, or other means for holding the cover closed can be employed.

5.3 Cast metal

5.3.1 Cast metal for a general purpose enclosure shall be at least 1/8 inch (3.2 mm) thick at every point, of greater thickness at reinforcing ribs and door edges, and not less than 1/4 inch (6.4 mm) thick at tapped holes for conduit; except that, other than at plain or threaded conduit holes, die-cast metal shall not be less than 3/32 inch (2.4 mm) thick for an area greater than 24 square inches (155 cm²) or having any dimension greater than 6 inches (152 mm), and shall not be less than 1/16 inch (1.6 mm) thick for an area of 24 square inches (155 cm²) or less and not having dimensions greater than 6 inches. The area limitation for metal 1/16 inch thick complying with the provision of reinforcing ribs subdividing a larger area. Die-cast metal of 0.035 inch (0.9 mm) minimum thickness can be employed in lieu of 1/16 inch thick die-cast metal when the enclosure will not be used as a splice box and when the voltage rating of the complete control is such that the voltage between any two conductors does not exceed 250 volts ac or dc; and die-cast metal of 0.028 inch (0.71 mm) minimum thickness can be employed in lieu of 1/16 inch thick die-cast metal for an enclosure housing only low-voltage circuits.

5.4 Sheet metal

5.4.1 The thickness of a sheet-metal enclosure shall be as indicated in Tables 5.1 and 5.2, except that steel shall be not less than 0.032 inch (0.81 mm) (No. 20 MSG) thick [0.034 inch (0.86 mm) (No. 20 GSG) thick when zinc coated] and nonferrous metal shall be not less than 0.045 inch (1.14 mm) (No. 18 GSG) thick at points where a wiring system is to be connected.

5.5 Nonmetallic

5.5.1 A nonmetallic material can be used for part or all of a general purpose enclosure when it complies with the requirements in 5.5.2 and 35.1.1.

5.5.2 A nonmetallic enclosure or enclosure part shall have mechanical strength and durability and be so formed that operating parts are protected against damage, and shall resist the abuses that will be encountered during installation and normal use and service. The enclosure or enclosure part shall protect persons from shock hazard, and the material shall not create or contribute to a hazardous condition.

5.5.3 Among the factors taken into consideration when evaluating a nonmetallic enclosure are:

- a) The mechanical strength;
- b) Resistance to impact;
- c) Moisture-absorptive properties;
- d) Combustibility and resistance to ignition from electrical sources;
- e) Dielectric properties, insulation resistance, and resistance to arc tracking; and

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