UL 1635

STANDARD FOR SAFETY

Digital Alarm Communicator System Units

UL Standard for Safety for Digital Alarm Communicator System Units, UL 1635

Fourth Edition, Dated April 13, 2018

Summary of Topics

The fourth edition of the Standard for Digital Alarm Communicator System Units, UL 1635, was issued to revise the operation requirements.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated January 17, 2014 and October 21, 2016.

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Standard for Digital Alarm Communicator System Units

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Second Edition – February, 1991
Third Edition – January, 1996

Fourth Edition

April 13, 2018

This ANSI/UL Standard for Safety consists of the Fourth Edition.

The most recent designation of ANSI/UL 1635 as an American National Standard (ANSI) occurred on April 13, 2018. 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 UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 These requirements cover digital alarm communicator system units for use in central-station burglar-alarm systems, proprietary burglar alarm systems, police station connect burglar-alarm systems, residential burglar-alarm systems, residential fire warning systems, and home health care medical alert systems.

1.2 As covered by these requirements, a digital alarm communicator system consists of a digital alarm communicator transmitter interconnected to or integral with:

a) A central-station burglar-alarm control unit,

b) A proprietary burglar alarm control unit,

c) A police-station-connect burglar-alarm control unit,

d) A residential burglar-alarm control unit,

e) A residential fire warning control unit, or

f) A home health care medical alert control unit.

A need for off premises transmission will activate the digital alarm communicator transmitter that contacts a digital alarm communicator receiver located at a central-station or residential monitoring station through the telephone company's switched network (dial system) and transmits a message identifying the change in condition at the protected premises or residence.

1.3 The operation of a digital alarm communicator system is under the control of the owner or others interested in the property, the occupants of the residence, and the operators at the central-station or residential monitoring station.

1.4 If equipment covered by these requirements is intended for use in a combination burglar-alarm and fire-protective signaling system, the portion of the equipment serving a fire-alarm function shall comply with the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864.

1.5 Service required to be provided by the central-station is covered by the Standard for Central-Station Alarm Services, UL 827.

1.6 A digital alarm communicator system may be classified as police-station connected if:

a) It is used in combination with a protected premises control unit, an alarm sounding device, and an alarm housing that complies with the Standard for Police Station Connected Burglar Alarm Units and Systems, UL 365, and

b) The signals are transmitted to a digital burglar-alarm communicator receiver located at a central-station that complies with the Standard for Central-Station Alarm Services, UL 827.

1.7 Devices installed on individual properties are further classified as to extent of protection at each location, according to the requirements covering installation and classification (of extent) of alarm equipment at individual locations as published in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, that should be consulted by burglar-alarm installers.

1.8 Digital alarm communicator units for use in residential burglar-alarm systems shall comply with the Standard for Household Burglar-Alarm System Units, UL 1023, in addition to the applicable requirements in this standard.

1.9 Digital alarm communicator units for use in residential fire warning systems shall comply with the Standard for Household Fire Warning System Units, UL 985, in addition to the applicable requirements in this standard.

1.10 Digital alarm communicator units for use in home health care medical alert systems shall comply with the Standard for Home Health Care Signaling Equipment, UL 1637, in addition to the applicable requirements in this standard.

2 Components

2.1 Except as indicated in 2.2 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.

2.2 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.

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

2.4 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.

3 Units of Measurement

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

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

4 Undated References

4.1 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.

5 Terminology

5.1 The term ″product″ as used in this standard refers to all types of digital alarm communicator units.

6 Glossary

6.1 For the purpose of this standard, the following definitions apply.

6.2 ACKNOWLEDGMENT SIGNAL – An audible and/or visual signal that is sent to the subscriber by the central station to notify the subscriber that a signal has been received indicating that the protection system has been properly armed. The acknowledgment signal is to be sent manually or automatically.

6.3 CIRCUITS, ELECTRICAL:

a) High-Voltage – 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 DC or AC peak.

c) Power Limited – A circuit whose output is limited as specified in Tables 6.1 and 6.2. The power limitation shall be provided by the construction of the transformer, a fixed impedance, a noninterchangeable fuse, a nonadjustable manual reset circuit protective device, or a regulating network.

Table 6.1
Power limitations for inherently limited power source (overcurrent protection not required)

Circuit voltage V_{max}[b] AC-DC (volts)	Maximum nameplate ratings		Current limitation I_{max}[b] (amperes)
	VA (volt amperes)	Current (amperes)	
0 to 20	$5.0 \times V_{max}$[a]	5.0	8.0
over 20 to 30	100	$100/V_{max}$[a]	8.0
over 30 to 100	100	$100/V_{max}$[a]	$100/V_{max}$[a]
over 100 to 250 DC only	$0.030 \times V_{max}$[a]	0.030	0.030

NOTE – Adapted from the National Electrical Code, (NFPA 70), 1996 Edition, copyright National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

[a] V_{max}: Maximum output voltage regardless of load with rated input applied. 0 – 20 V-rms, 0 – 28.3 V DC or AC peak; 20 – 30 V-rms, 28.3 – 42.4 V DC or AC peak

[b] I_{max}: Maximum output after 1 minute of operation under any noncapacitive load, including short circuit.

Table 6.2
Power limitations for power sources not inherently limited (overcurrent protection required)

Circuit voltage	Maximum nameplate ratings		Current limitation	Power limitation	Maximum Overcurrent
V_{max}[a] AC-DC (volts)	VA (volt amperes)	Current (amperes)	I_{max}[b] (amperes)	$(VA)_{max}$[c] (volt amperes)	Protection (amperes)
0 to 20	$5.0\times V_{max}$[a]	5.0	$1000/V_{max}$[a]	250[d]	5.0
over 20 to 100	100	$100/V_{max}$[a]	$1000/V_{max}$[a]	250[d]	$100/V_{max}$[a]
over 100 to 150	100	$100/V_{max}$[a]	1.0	NA	1.0

NOTE – Adapted from the National Electrical Code, (NFPA 70), 1996 Edition, copyright National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

[a] V_{max}: Maximum output voltage regardless of load with rated input applied. See footnote a in Table 6.1.

[b] I_{max}: Maximum output after 1 minute of operation under any noncapacitive load, including short circuit, and with overcurrent protection bypassed.

[c] $(VA)_{max}$: Maximum volt-ampere output regardless of load with overcurrent protection bypassed.

[d] If the power source is a transformer $(VA)_{max}$ is 350 or less when V_{max} is 15 or less.

6.4 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.

6.5 DIGITAL ALARM COMMUNICATOR RECEIVER – A unit located at a central-station or a residential monitoring station that will receive and display signals from a digital alarm communicator transmitter.

6.6 DIGITAL ALARM COMMUNICATOR TRANSMITTER – A unit located at the protected premises or residence that will contact the digital alarm communicator receiver through the telephone company's switched network (dial system) and transmit the necessary data to identify the digital alarm communicator transmitter and the change of status at the protected premises or residence. As covered by these requirements, the digital alarm communicator transmitter either:

a) Provides all alarm or monitoring control functions or

b) Interfaces with an alarm or monitoring control unit that provides this function (a slave unit).

6.7 FIXED EQUIPMENT – A device intended to be permanently connected electrically.

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

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

6.10 OFF-HOOK – The condition in which a connection has been established with the telephone company's switched network in preparation for dialing a telephone number.

6.11 ON-HOOK – The condition causing the equipment to disconnect from (hang up) the telephone company's switched network.

6.12 PORTABLE EQUIPMENT – Cord- and plug-connected equipment that is capable of being carried or moved about.

6.13 PRIMARY BATTERY – A battery that by construction is not intended to be recharged.

6.14 RADIO FREQUENCY – Electromagnetic radiation, nominally above 20 kilohertz.

6.15 RESIDENTIAL MONITORING STATION – A building equipped with receiving equipment that receives and displays the information to the operator for action. See 1.6.

6.16 SAFETY CIRCUIT – Any primary or secondary 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 (for example, an interlock circuit).

6.17 SECONDARY BATTERY – A battery that by construction is intended to be recharged.

6.18 STATIONARY EQUIPMENT – Cord- and plug-connected equipment that is intended to be fastened in place, or located in a dedicated space.

7 Installation and Operating Instructions

7.1 A copy of:

a) The installation and operating instructions intended to accompany each product or component as produced,

b) The related schematic wiring diagrams, and

c) The installation drawings

is to be furnished with the product submitted for investigation, to be used as a guide in the examination and test of the product or component. For this purpose, a final printed edition is not required.

7.2 The instructions and drawings shall include at least the following:

a) Typical installation drawing layouts and a complete representative installation wiring diagram(s) for the product(s) indicating recommended locations and wiring methods that shall be in accordance with the National Electrical Code, ANSI/NFPA 70-1996, the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, the Standard for Central-Station Burglar-Alarm Systems, UL 611, the Standard for Installation and Classification of Residential Burglar Alarm Systems, UL 1641, National Fire Alarm Code, NFPA 72-1993, Chapter 2 or Household Fire Warning Equipment, ANSI/NFPA 74-1989, as applicable. Locations where installations are not recommended shall also be included.

b) Concise description of the operation, testing, and maintenance procedures for the product(s), and recommended testing frequency (that shall be at least once each year).

c) Identification of replacement parts, such as lamps or batteries, by a part number, manufacturer's model number, or the equivalent.

d) A description of the conditions that might be expected to result in false alarms or impaired operation of the product(s).

e) A description of any features provided to reduce the risk of fire, electric shock, or injury to persons and a warning against bypassing such features.

7.3 The instructions may be incorporated on the inside of the product, on a separate sheet, or as part of a manual. If not included directly on the product, the instructions or manual shall be referenced in the marking information on the product. See (Marking) General, Section 84.

8 Electric Shock

8.1 Any part that is exposed only during operator servicing shall not present the risk of electric shock. See the Electric Shock Current Test, Section 42.

8.2 The insertion of the intended component into a socket in the product shall not result in a risk of electric shock.

CONSTRUCTION

ASSEMBLY

9 General

9.1 Product assembly

9.1.1 The product shall be factory-built as a complete assembly and shall include all the components necessary for its intended function when installed and used as intended. The product may be shipped from the factory as two or more major subassemblies. See 9.1.2.

9.1.2 If the product is not assembled by the manufacturer as a complete unit, it shall be arranged in major subassemblies. Each subassembly shall be capable of being incorporated into a complete assembly without requiring alteration, cutting, drilling, threading, welding, or similar tasks by the installer. Two or more subassemblies, that must bear a definite relationship to each other for the correct installation or operation of the product shall be arranged and constructed to permit them to be incorporated into the complete assembly only in the correct relationship without need for alteration or alignment, or such subassemblies shall be assembled, tested, and shipped from the factory as one product.

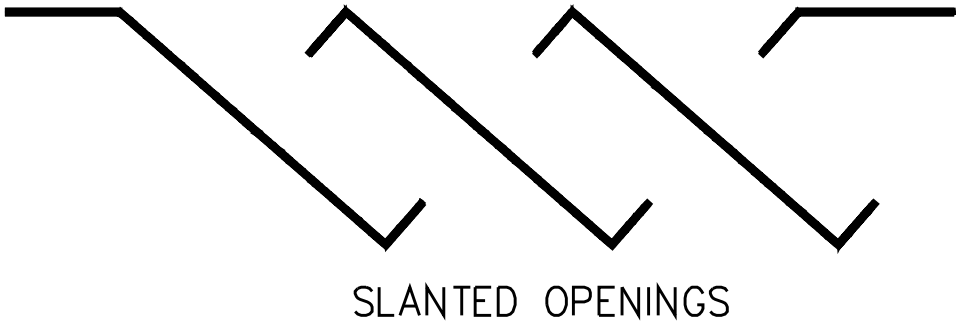
9.2 Electrical protection

9.2.1 Louvers and other openings in the enclosure shall be constructed and located to reduce the risk of unintentional contact with uninsulated high-voltage live parts. In determining compliance with this requirement, parts such as covers, panels, and grilles used as part of the enclosure are to be removed unless tools are required for their removal or an interlock is provided. See also Protection of Service Personnel, Section 10.

9.2.2 Uninsulated high-voltage live parts shall be located, guarded, or enclosed as indicated in 9.2.3 – 9.2.5.

9.2.3 Openings directly over uninsulated high-voltage live parts shall not exceed 0.187 inch (4.75 mm) in any dimension, or shall be of a configuration as illustrated by Figure 9.1 for top cover designs and Figure 9.2 for side opening designs, or the equivalent.

Figure 9.1
Cross sections of top cover designs



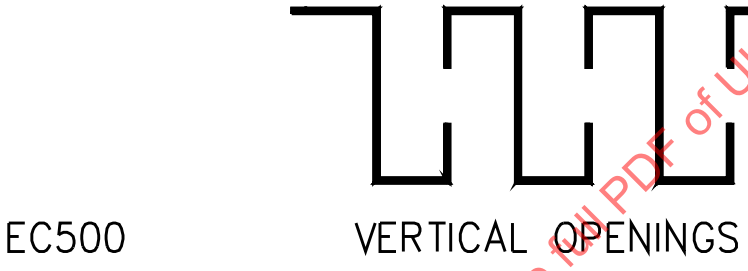
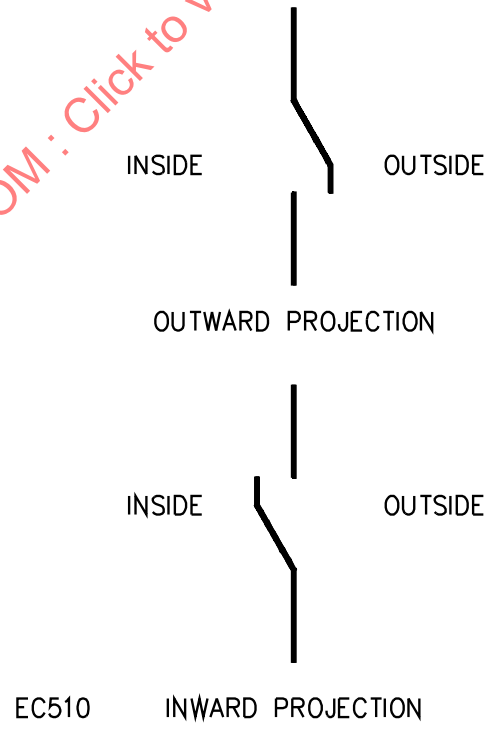


Figure 9.2
Cross section of side louvers



9.2.4 An opening in an electrical enclosure that does not permit entrance of a 1 inch (25.4 mm) diameter rod shall be sized and arranged so that a probe, as illustrated in Figure 9.3, cannot be made to contact any uninsulated live part (other than low-voltage) when inserted through the opening in a straight or articulated position.

9.2.5 An opening that permits entrance of a 1 inch (25.4 mm) diameter rod may be used under the conditions described and illustrated in Figure 9.4.

Figure 9.3
Accessibility probe

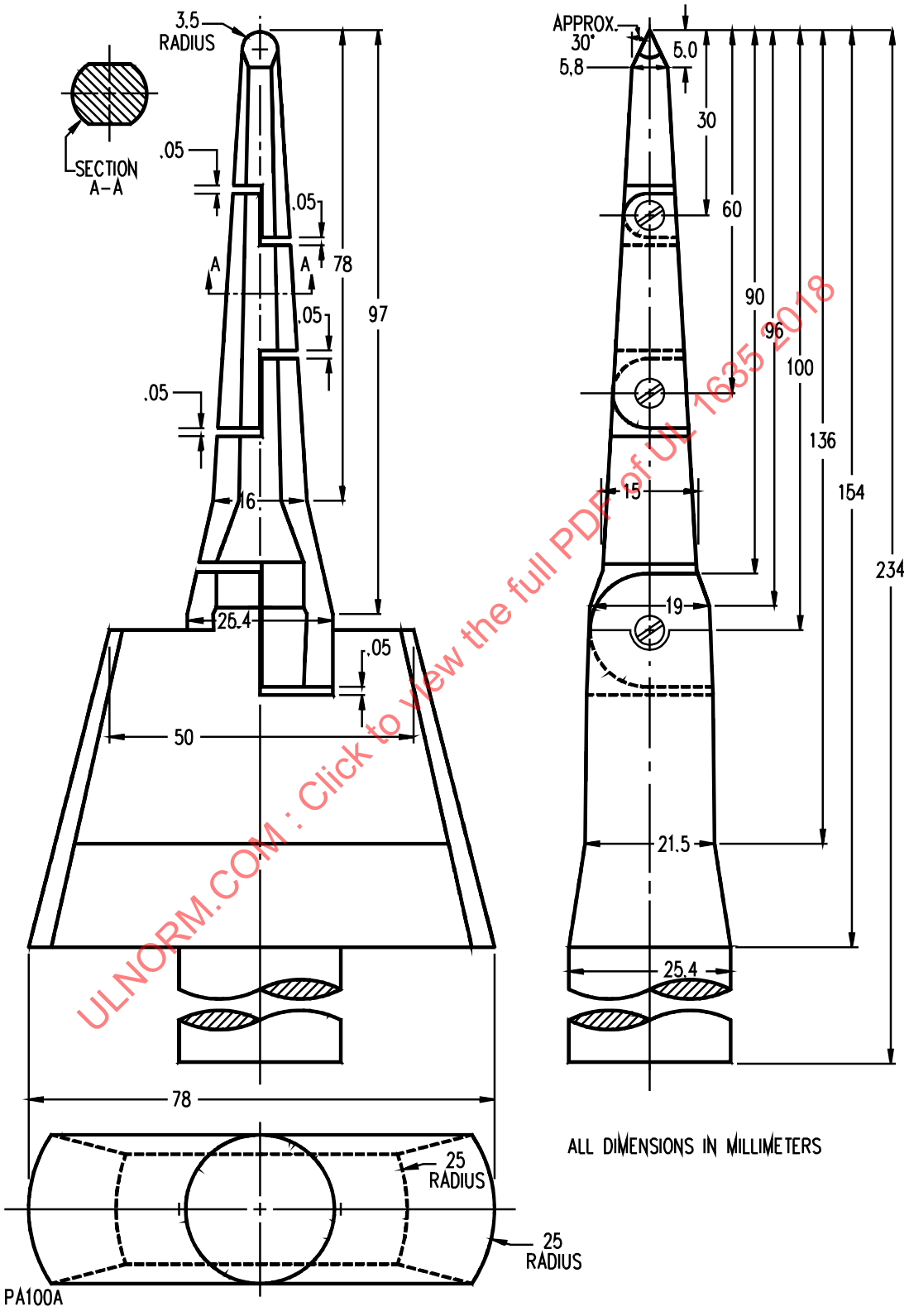
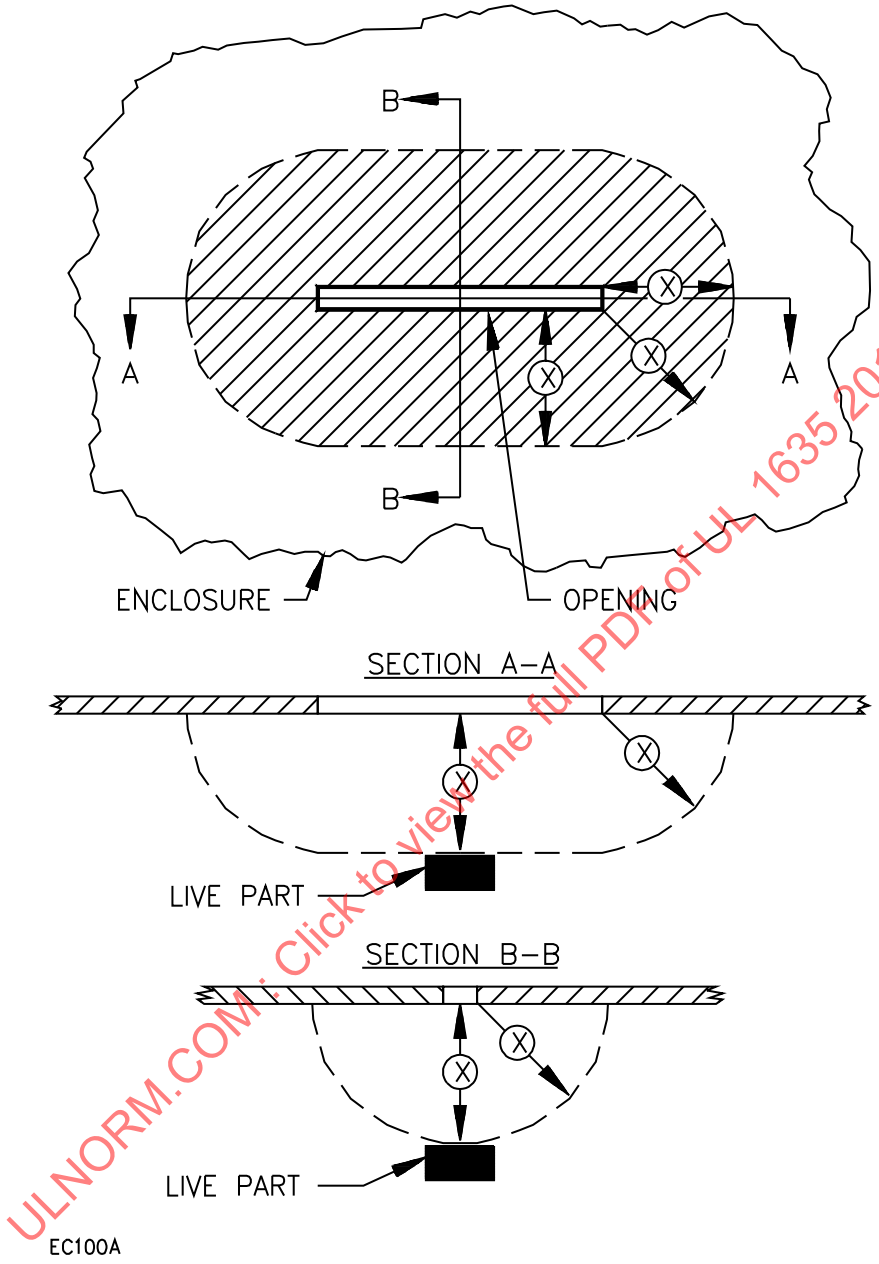


Figure 9.4
Opening in enclosure



The opening may be used if, within the enclosure, there is no uninsulated live metal part or enamel-insulated wire:

a) Less than X inches (mm) from the perimeter of the opening, as well as

b) Within the volume generated by projecting the perimeter X inches (mm) normal to its plane.

X equals five times the diameter of the largest diameter rod that can be inserted through the opening, but not less than 6-1/16 inches (154 mm).

10 Protection of Service Personnel

10.1 An uninsulated live part of a high-voltage circuit within the enclosure shall be located, guarded, or enclosed so as to reduce the risk of unintentional contact by persons performing service functions that may be performed while the equipment is energized.

10.2 During the examination of a product in connection with the requirements in 10.1, a part of the outer enclosure that may be removed without the use of tools, or part of the outer enclosure that may be removed by the user to allow access for making routine operating adjustments is to be disregarded. It is to be assumed that the removable part in question does not afford protection against the risk of electric shock.

10.3 An electrical component that may require examination, replacement, adjustment, servicing, or maintenance while the product is energized shall be located and mounted with respect to other components and with respect to grounded metal so that the component is accessible for such service and risk of electric shock to the service person from adjacent uninsulated high-voltage live parts is reduced.

10.4 The following are not considered to be uninsulated live parts:

a) Coils of relays and solenoids, and transformer windings, if the coils and windings are provided with insulating overwraps rated for the potentials encountered,

b) Terminals and splices with insulation rated for the potential encountered, and

c) Insulated wire.

11 Enclosures

11.1 General

11.1.1 The enclosure of a product shall have the strength and rigidity to resist total or partial collapse and the attendant reduction of spacings, loosening or displacement of parts, or other defects. See the Mechanical Strength Tests for Enclosures, Section 56.

11.1.2 Operating parts, such as gear mechanisms, light-duty relays, and similar devices, shall be enclosed to protect against malfunction due to dust or other material that may impair their intended operation.

11.1.3 An enclosure containing other than power limited circuits shall be constructed to reduce the possibility of emission of flame, molten metal, flaming or glowing particles, or flaming drops. See the Ignition Through Bottom-Panel Openings Tests, Section 55.

11.1.4 The requirement in 11.1.3 necessitates either a nonflammable bottom in accordance with the requirements in 11.3.2, or a protective barrier as illustrated in Figure 11.1 under all areas containing combustible materials.