UL 1610

STANDARD FOR SAFETY

Central-Station Burglar-Alarm Units

UL Standard for Safety for Central-Station Burglar-Alarm Units, UL 1610

Fourth Edition, Dated July 5, 2016

Summary of Topics

This revision of UL 1610 dated April 21, 2021 is issued to remove the ANSI designation from the standard.

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

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UL 1610

Standard for Central-Station Burglar-Alarm Units

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Fourth Edition

July 5, 2016

This UL Standard for Safety consists of the Fourth Edition including revisions through April 21, 2021.

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 components of central-station burglar-alarm systems intended and specifically designated for burglary-protection use at mercantile and banking premises, on mercantile safes, and on bank safes and vaults.

1.2 The components covered by these requirements are intended for use in a burglar-alarm system in which the operations of electrical protection circuits and devices are transmitted automatically to, recorded in, maintained from, and supervised from a central-station that employs trained operators and alarm investigators who are in attendance at all times.

1.3 These requirements serve as the basis of classification of central-station burglar-alarm system transmission methods. The systems may be classified as either standard line security equipment or encrypted line security equipment by virtue of the construction and performance requirements for components of that system. However, requirements covering the complete systems are contained in the Standard for Central-Station Alarm Services, UL 827.

1.4 Protective 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 protective equipment at individual locations as published in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681.

1.5 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 is covered by the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864.

1.6 Systems covered by these requirements operate using Class 2 remote-control and signaling circuits as defined by Article 725 of the National Electrical Code, NFPA 70.

1.7 The requirements assume that standard telephone operating practices are acceptable for leased or other lines connecting to a central-station as defined by Article 800 of the National Electrical Code, NFPA 70.

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 If a value for measurement is followed by an equivalent value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

2.2.2 Unless otherwise indicated, all voltage and current values specified in this standard are 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 this standard refers to all types of central-station burglar-alarm units.

3 Glossary

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

3.2 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 can be sent manually or automatically.

3.3 ADMINISTRATOR – An authorized entity that is in possession of the credentials necessary for the ability to perform an upgrade to a control unit's software and/or firmware.

3.4 BIOMETRICS – Authentication of human physical characteristics used to identify an individual.

3.5 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 rms, 42.4 volts DC or AC peak.

c) Power-Limited – A circuit whose output is limited as specified in Table 3.1 and Table 3.2. 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 3.1
Power limitations for inherently limited power source (overcurrent protection not required)

Circuit voltage V_{max}[a] AC-DC, volts	Maximum nameplate ratings		Current limitation I_{max},[b] amperes
	VA, volt-amperes	Current, amperes	
0 to 20	5.0 x 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]	150/V_{max}[a]
over 100 to 250 DC[a] only	0.030 x V_{max}[a]	0.030	0.030

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

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

Table 3.2
Power limitations for power sources not inherently limited (overcurrent protection required)

Circuit voltage V_{max}[a] AC-DC, volts	Maximum nameplate ratings		Current limitation I_{max},[b] amperes	Power limitation $(VA)_{max}$,[c] volt-amperes	Maximum overcurrent protection, amperes
	VA, volt-amperes	Current, amperes			
0 to 20	5.0 x 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

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[a] V_{max}: Maximum output voltage regardless of load with rated input applied. See footnote a to Table 3.1.

[b] I_{max}: Maximum output current 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 than V_{max} is 15 or less.

3.6 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.

3.7 CREDENTIAL – A mechanism that defines or distinguishes the identity of an entity (e.g. a password, or PIN or biometric).

3.8 CRYPTOGRAPHIC AUTHENTICATION – Algorithms intended to ensure the secrecy and/or authenticity of messages.

3.9 DIGITAL ALARM COMMUNICATOR (DAC) – A transmission method as outlined in the Standard for Digital Alarm Communicator System Units,UL 1635, by cellular and/or telephone landline transmission.

3.10 ENTITY – Person, device, and/or appliance or service which interacts with a control unit.

3.11 EVENT LOG – A comprehensive data record, maintained at the control unit and/or central station of the events that are associated with remote access.

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

3.13 HARDWIRE KEY DEVICE – A mechanical or electronic device employed to enable the remote programming mode.

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

3.15 MANAGED FACILITIES-BASED VOICE NETWORK (MFVN) – A physical facilities-based network capable of transmitting real time signals with formats unchanged that is managed, operated, and maintained by the service provider to ensure service quality and reliability from the subscriber location to public switched telephone network (PSTN) interconnection points or other MFVN peer networks.

3.16 MULTIPLEXING – A signaling method using wire path, cable carrier, radio, or combinations of these methods characterized by the simultaneous and/or sequential transmission and reception of multiple signals in a communication channel including means for positively identifying each such signal.

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

3.18 PACKET SWITCHED DATA NETWORK (PSDN) – A type of data transmission in which data is divided into packets, each of which has a destination address. Each packet is then routed across a computer network. A packet may travel a different route than packets related to it.

3.19 PLAINTEXT – A character representation that is plainly readable as text and not masked and/or hidden.

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

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

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

3.23 REMOTE ACCESS – The act of accessing a control unit at a distance from the protected premises, whereby the user does not have visual contact of the premises. Key FOB's are not included in this definition; because they are intended to be used when in visual contact with the protected premises and are very limited in the distance they may be used.

3.24 REMOTE COMMUNICATION – Data exchange in which information is exchanged between the control unit and an authorized entity.

3.25 REMOTE OPERATION – The connection to the protected premises control unit via remote communications.

3.26 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).

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

3.28 SIGNAL TRANSMISSION METHODS – Any of the following methods; direct wire, multiplex, derived channel, two way radio (RF), DACT/DACR, one way radio (RF), packet switched data network, or code transmitter.

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

3.30 TRUSTED PHYSICAL PATH – A contiguous and visible path for communications constructed of physical media. A directly connected crossover network cable, USB cable, or vendor approved cable would be considered a trusted path.

3.31 USER – A person who has authorized access to the control unit.

3.32 USER VALIDATION – The act of an electronic device, upon the input of "user credentials", validating that the credentials are legitimate, allowing the user to proceed to access the system, or upon failure to match the credentials, deny access to the system. (See Appendix B).

4 Installation and Operating Instructions

4.1 A copy of the:

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

b) Related schematic wiring diagrams, and

c) Installation drawings

shall be furnished with the sample 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.

4.2 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, the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, and the Standard for Central-Station Alarm Services, UL 827. 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 per 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.

4.3 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 100.

5 Installation and Operating Instructions Physical Media

5.1 The installation diagram(s) and any special field installation instructions shall be attached to the unit or, when separate, shall be provided in printed hardcopy format. A copy shall be supplied with each individual product or with each single shipment when multiples of the same products are shipped directly (to an end customer) in a single shipment.

5.2 The following sections contain information that shall be provided in printed hardcopy format and supplied with the unit(s):

a) 4.2(a);

b) 13.2.3.1(b);

c) 13.2.3.2(a);

d) 13.2.3.2(b);

e) 13.2.3.2(c);

f) 13.3;

g) Section 34, Variable Ambient Test;

h) 100.1, Exception No. 1;

i) 100.3;

j) 100.4;

k) 100.11;

l) 103.3;

m) 103.4; and

n) 105.3.

5.3 Other installation instructions, operating and test instructions shall be made available by printed hardcopy or by electronic media such as a CD, DVD, website, or equivalent. Optionally, a copy may be supplied with each individual product or with each single shipment when multiples of the same products are shipped directly (to an end customer) in a single shipment.

6 Electric Shock

6.1 Any part that is exposed only during operator servicing shall not present the risk of electric shock. See Electric Shock Current Test, Section 37.

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

CONSTRUCTION

ASSEMBLY

7 General

7.1 Product assembly

7.1.1 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 7.1.2.

7.1.2 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 unit.

7.2 Electrical protection

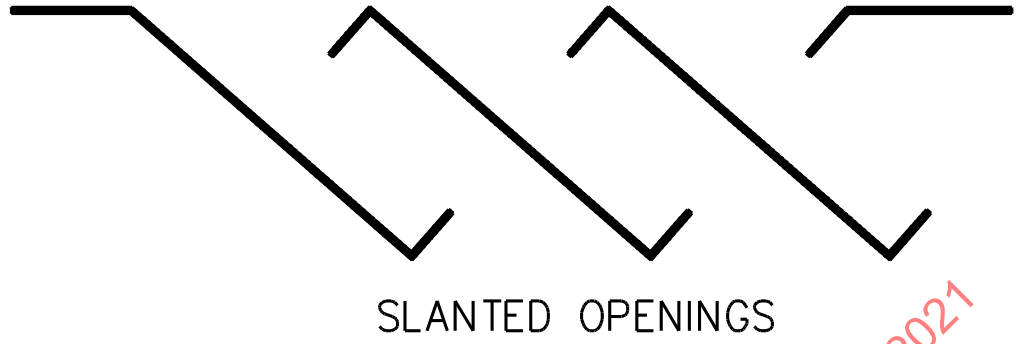
7.2.1 Louvers and other openings in the enclosure shall be constructed and located to reduce the risk of unintentional contact with uninsulated high-voltage live parts. In determining compliance with this requirement, parts such as covers, panels, and grilles used as part of the enclosure are to be removed unless tools are required for their removal or an interlock is provided. See also Protection of Service Personnel, Section 8.

7.2.2 Uninsulated high-voltage live parts shall be located, guarded, or enclosed as indicated in 7.2.3 – 7.2.5.

7.2.3 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 7.1 for top cover designs and Figure 7.2 for side opening designs, or the equivalent.

Figure 7.1

Cross sections of top cover designs



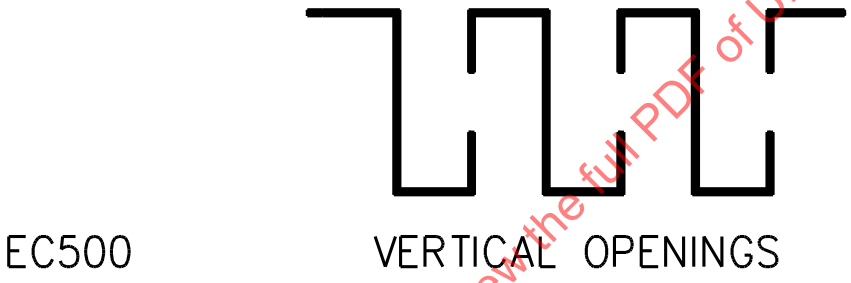
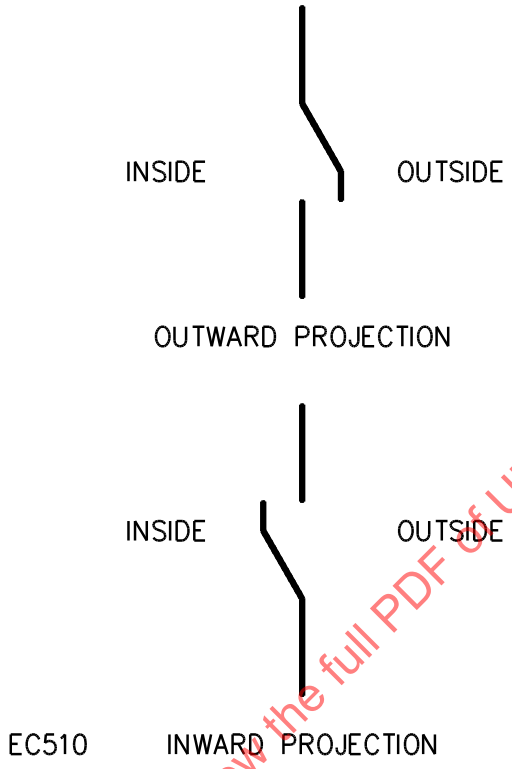


Figure 7.2

Cross sections of side louvers



7.2.4 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 7.3, cannot be made to contact any uninsulated live part (other than low voltage) when inserted through the opening in a straight or articulated position.

7.2.5 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 7.4.

Figure 7.3

Accessibility probe

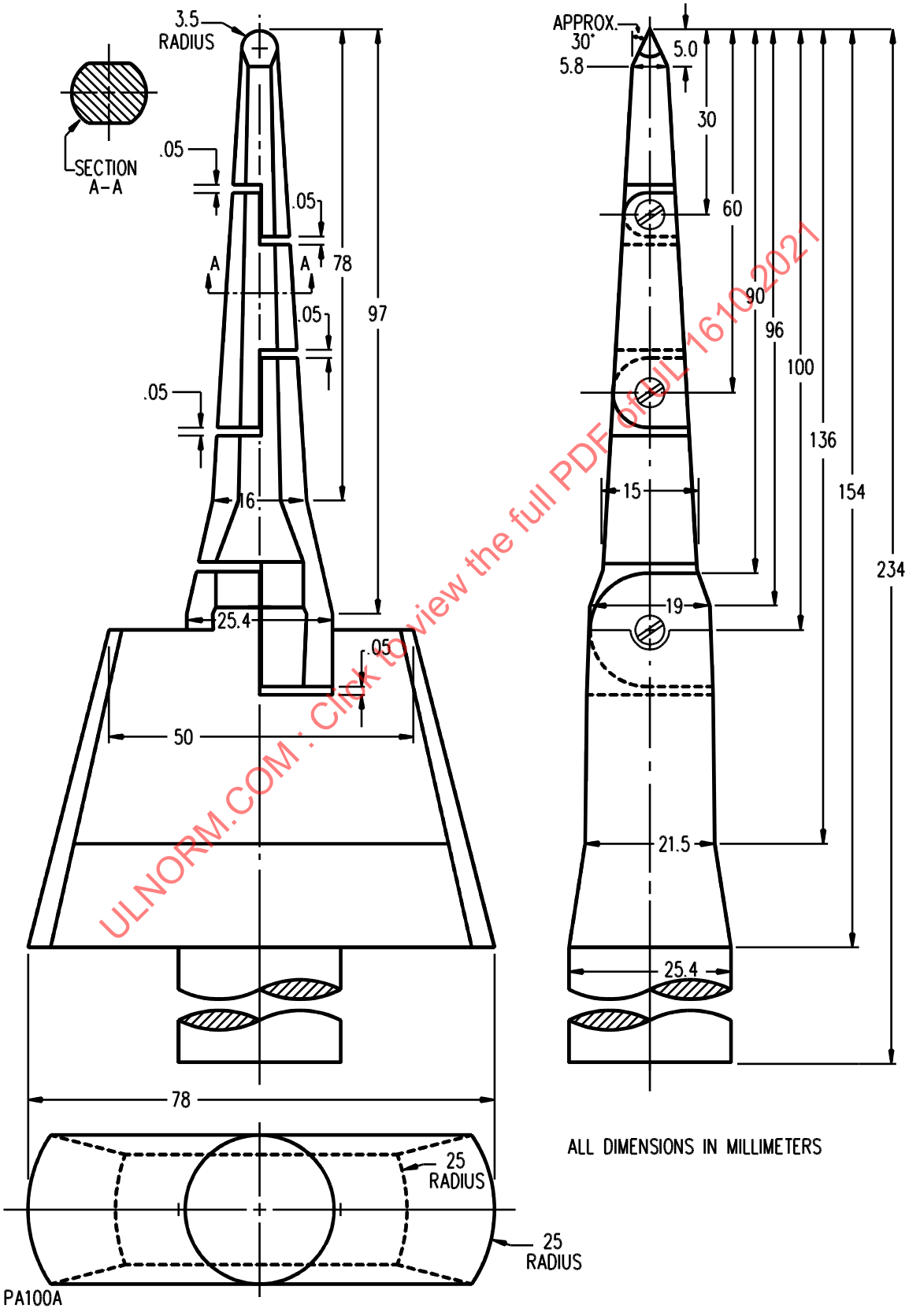
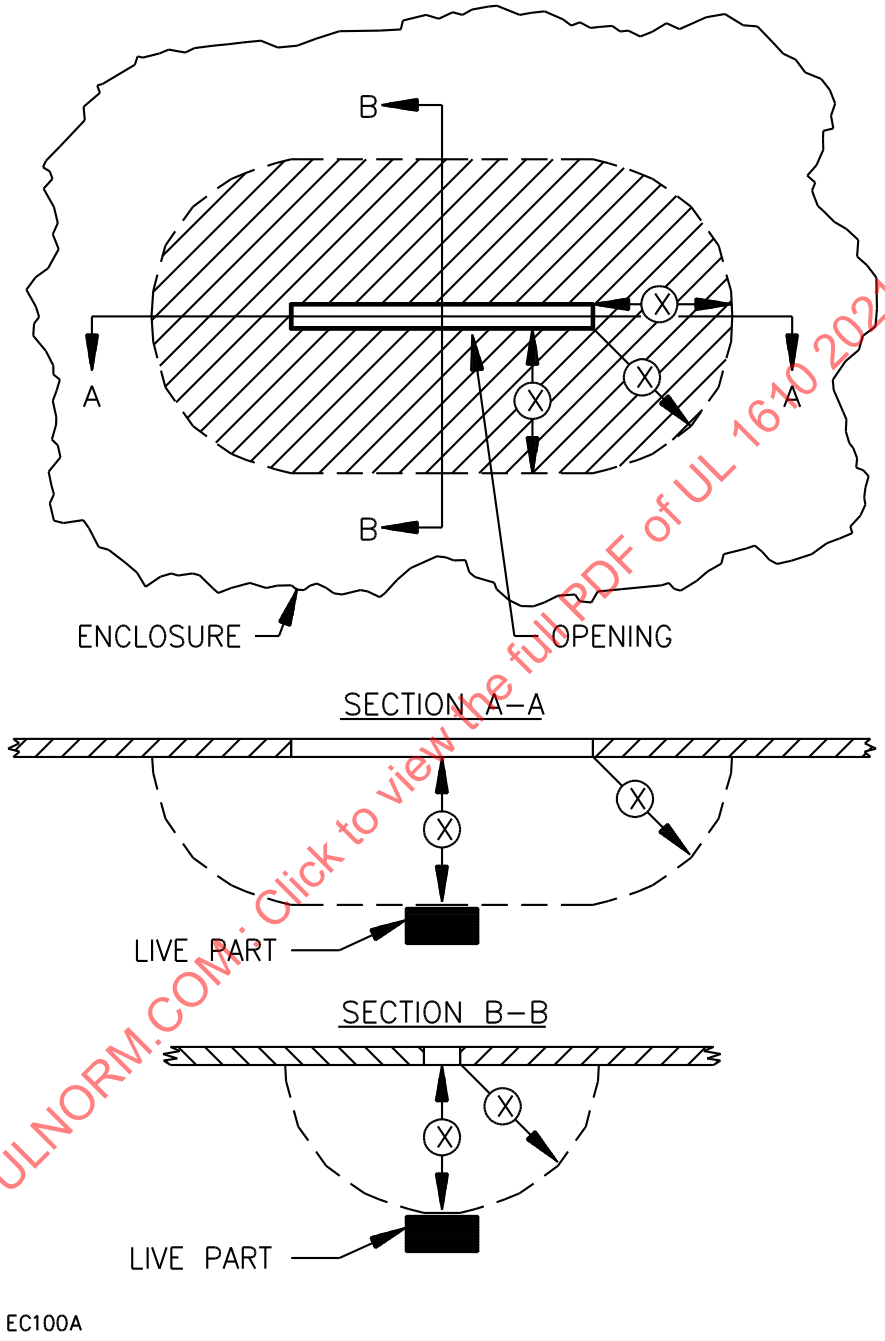


Figure 7.4

Opening in enclosure



EC100A

NOTE – The opening may be used if, within the enclosure, there is no uninsulated live part or film coated 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).