

UL 1863

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Communications-Circuit Accessories

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UL Standard for Safety for Communications-Circuit Accessories, UL 1863

Fourth Edition, Dated May 14, 2004

Summary of Topics

This new edition is a periodic re-issuance to ensure that UL's Standards remain up-to-date with regard to format and editorial issues such as renumbering, repaginating, correction of editorial errors, correction of cross-references and updating titles of referenced Standards. This new edition also contains revisions to the Scope paragraphs, the sheet metal tables in Section 6, and the graphics and tables in Section 24 in accordance with UL's bulletins dated May 19, 2003, and February 6, 2004.

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The new and/or revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated May 19, 2003 and February 6, 2004. The bulletin(s) is now obsolete and may be discarded.

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.

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ANSI/UL 1863-2004

UL 1863

Standard for Communications-Circuit Accessories

First Edition – January, 1990
Second Edition – October, 1995
Third Edition – May, 2000

Fourth Edition

May 14, 2004

The most recent designation of ANSI/UL 1863 as an American National Standard (ANSI) occurred on April 7, 2004.

This ANSI/UL Standard for Safety, which consists of the Fourth Edition with revisions through May 14, 2004, is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to UL-SC Standards Department, 1655 Scott Blvd., Santa Clara, CA 95050.

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.

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INTRODUCTION

1 Scope

1.1 These requirements cover telecommunications-circuit accessories, such as jack and plug assemblies, quick-connect terminal assemblies, telephone wall plates, telephone extension cords, cross-connect terminal-block assemblies, maintenance terminal modules, terminal enclosures, cable-splice enclosures, network-interface devices, wire-guide assemblies, and connector boxes.

1.2 These devices are intended to be used in telecommunications networks that have an operating root-mean-square (rms) voltage to ground less than 150 volts and installed or used in accordance with the National Electrical Code, ANSI/NFPA 70.

1.3 These requirements do not cover telephone equipment such as telephone answering devices, residential telephone instruments, telephone dialers, cordless phones, key systems, and private-branch exchange equipment that is covered by the Standard for Information Technology Equipment – Safety – Part I: General Requirements, UL 60950-1. Also, these requirements do not cover:

- a) Telephone protectors that are covered by the Standard for Protectors for Paired-Conductor Communications Circuits, UL 497, and
- b) Secondary protectors that are covered by the Standard for Secondary Protectors for Communications Circuits, UL 497A.

1.3 revised May 14, 2004

1.4 These requirements do not cover receiver/transmitter-type devices. Equipment of this type is covered by the Standard for Audio-Video Products and Accessories, UL 1492, or the Standard for Audio/Video and Musical Apparatus for Household, Commercial, and Similar General Use, UL 6500. These requirements do not cover cellular telephones or cellular devices. Equipment of this type is covered by UL 1492.

1.4 revised May 14, 2004

1.5 These requirements may be used, directly or by reference, to investigate portions of other equipment, not classified as telecommunications-equipment accessories, that may be connected to a telecommunications network, insofar as they may be applicable to such equipment.

1.6 These requirements do not cover wires and cables intended to be permanently installed in a building in accordance with Article 800 of the National Electrical Code, ANSI/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 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.

3 Glossary

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

3.2 COMMON MODE VOLTAGE – When applied to telecommunications leads, this term refers to the voltage between any conductor or connection point and earth ground. Also referred to as Longitudinal Voltage.

3.3 DIFFERENTIAL MODE VOLTAGE – When applied to telecommunications leads, this term refers to the voltage between any conductors or connection points excluding those connected to earth ground. Also referred to as Metallic Voltage.

3.4 ELECTRICAL ENERGY – HIGH-CURRENT LEVELS (POWER SUPPLIES) – The capability for damage or injury to persons (other than by electric shock) from available electrical energy is considered to exist when, between a live part and an adjacent dead-metal part or between live parts of different polarity, there exists a potential of 2 volts or more and either:

- a) An available continuous power level of 240 volt-amperes or more or
- b) A reactive energy level of 20 joules or more.

For example, a tool (or other metal) short-circuiting a component is capable of posing a risk of fire, electric shock, or injury to persons (burns) when enough energy is available at the component to vaporize, melt, or more than warm the metal.

3.5 ENCLOSURE – The word "enclosure" refers only to parts that house or cover:

- a) Uninsulated live parts that involve a risk of electric shock or
- b) Parts that involve a risk of fire, electrical energy/high-current levels, or injury to persons.

An enclosure may be an integral part of a component, a separate item or part of an outer cabinet.

3.6 FIXED OR STATIONARY EQUIPMENT – Equipment that is not easily moved, and is intended to be moved from one place to another only when de-energized. Fixed equipment is usually fastened or secured to the building.

3.7 GROUND – A conducting connection, whether intentional or otherwise, between electrical circuits or electrical equipment and either the earth or some conducting body that serves in place of the earth.

3.8 GROUNDING – The act of establishing a conductive connection, whether intentional or otherwise, between an electrical circuit or electrical equipment and earth.

3.9 LONGITUDINAL VOLTAGE – See 3.2, Common Mode Voltage.

3.10 METALLIC VOLTAGE – See 3.3, Differential Mode Voltage.

3.11 NETWORK OPERATING VOLTAGES – Telecommunications networks normally operate at voltages of 56.5 volts DC or less, unless the source impedance is above the range of 300 – 1600 ohms. For equipment connected to a single tip and ring pair, alerting and test voltages higher than 56.5 volts are generally intermittent and will be present over less than 1 percent of the usage of the

equipment. [Some telecommunications equipment, such as PBX and Key systems, may have a greater percentage of usage or operate at a higher voltage (such as T type lines)]. Maximum ring voltages may not exceed 200 volts peak-to-ground or 300 volts peak-to-peak.

3.12 NONPROTECTED SIDE – The portion of the loop circuit that rests on the primary side of a telephone protector installed by the operating telephone company. The fault current limitation is subject to the breakdown voltage characteristics of the primary protector and its coordinated fusing system (e.g., fuse link or bridle wire) with which the protector is intended to be used.

3.12 revised May 14, 2004

3.13 PORTABLE EQUIPMENT – Equipment that is easily moved and can be carried or conveyed by hand. Portable equipment is usually hand-held or hand-supported.

3.14 PRODUCT – This term refers to all types of telephone equipment and appliances likely to be used in residential, commercial, and industrial environments.

3.15 PROTECTED SIDE – Refers to that portion of the loop circuit that is connected to the secondary or output side of the primary telephone protector and is limited to short and long term current requirements for secondary protectors.

3.16 RISK OF ELECTRIC SHOCK – The risk that a person encounters when exposed to live uninsulated parts of a product that have a voltage and current sufficient to cause an electric shock, as defined in Accessibility and Electric Shock, Section 8.

3.17 RISK OF FIRE – The risk that a fire may occur as a result of equipment or component failure or the application of specified test conditions. A risk of fire is considered to exist at any component unless an investigation of the circuit delivering power to that component complies with the power limitations criteria cited in this standard.

3.18 RISK OF INJURY TO PERSONS – A risk of injury to persons is considered likely to occur when one or more of the following conditions exist:

- a) Sharp edges, burrs, or projections are present that can cause injury during use or servicing.
- b) The stability of a product is such that it can cause injury to persons. See Stability, Section 22.
- c) Uninsulated live parts involving a risk of electrical-energy/high-current levels are accessible to personnel. See Accessibility and Electric Shock, Section 8.
- d) Contact with accessible live parts can cause an involuntary reaction that is a risk of injury. See Accessibility and Electric Shock, Section 8.

3.19 TELECOMMUNICATIONS – Any transmission or reception of information such as signals, images, writing, or sounds, by electronic means.

3.20 TELECOMMUNICATIONS EXTENSION CORD – A telecommunications line cord that has a male connector on one end and a female connector on the other end.

3.21 TELECOMMUNICATIONS LINE CORD – The flexible cord used to connect a telephone set or other telecommunications device to the telecommunications line at the network interface or connecting blocks within the loop circuit. The cord may have male locking-type modular connectors on one or both ends for a plug-in arrangement or may have spade terminals on either or both ends for screw-type connections.

3.22 TELECOMMUNICATIONS NETWORK – A metallically terminated transmission medium intended for communication between equipment that may be located in separate buildings, excluding:

- a) The mains system for supply, transmission and distribution of electrical power, if used as a telecommunications transmission medium;
- b) Cable distribution systems; and
- c) Interconnecting circuits of information technology equipment.

Examples of telecommunications networks are a public switched telephone network; a public data network; an Integrated Services Digital Network (ISDN); and a private network with electrical interfaces similar to the above.

3.22 revised May 14, 2004

3.23 TELECOMMUNICATIONS NETWORK INTERFACE DEVICE – A piece of equipment that may have an enclosure that provides a point of interconnection between the telephone company communications network facilities and terminal equipment, protective apparatus or wiring at a subscriber's premises. The network interface or demarcation point is located on the subscriber's side of the telephone company's protector, or what has been determined to be the equivalent, in cases where the protector is not used, as provided under the local telephone company's reasonable and nondiscriminatory standard operating practices. The network interface enclosure may use compatible telephone protectors within the unit.

3.23 revised May 14, 2004

3.24 TELECOMMUNICATIONS (TELEPHONE) EQUIPMENT – A device intended to be connected to a telecommunications network and used for receiving information or transmitting information, or both, along the network.

3.25 TELEPHONE FIELD-WIRING TERMINAL – Any terminal to which a telephone circuit can be connected by an installer in the field is a telephone field-wiring terminal unless the wire is provided as part of the product and installed within the factory. A telephone field-wiring terminal may consist of a screw-type terminal, quick-connect insulation stripping system, wire wrap terminal, or plug/jack arrangement.

3.26 TELEPHONE LOOP BRANCH CIRCUIT – The circuit that connects telephone equipment to the network interface. For simple wiring, this is a single pair of conductors per circuit. For system wiring, this may consist of multipair conductors. The telephone loop circuit may be branched at a junction point, usually contained in a cross-connect terminal block, network interface device or assembly, or telephone outlet terminal block.

3.27 TOOL – Any means, other than manual manipulation, needed to open an enclosure of a device.

3.28 USER'S ACCESS AREA – All external surface areas and all internal areas that can be entered without the use of a tool, and all areas that the user is instructed to enter regardless of whether or not tools are needed to gain access.

3.29 USER SERVICING – Any form of servicing that can be performed by personnel other than those who are trained to maintain the equipment. User servicing is limited to user's access area. Some examples of user servicing are:

- a) The installation of accessories by means of separable connectors such as modular connectors, attachment plugs and receptacles.
- b) The changing or replacement of accessory boards, lamps, fuses, and resetting of circuit breakers.

CONSTRUCTION

4 General

4.1 A communications-circuit accessory shall be constructed so that it will be durable for its intended installation and use, as determined by compliance with the performance requirements of this standard.

4.2 A product shall use materials that have been deemed acceptable for the particular use, as determined by the performance requirements of this standard.

4.3 Metals shall not be used in such combination as to cause galvanic action that will increase the risk of fire, electric shock, or injury to persons.

4.4 When breakage or deterioration of a part such as an enclosure, a frame, a guard, or the like can result in a risk of injury to persons, the part shall be constructed to meet the demand of expected loading conditions.

5 Product Assembly

5.1 Except as specified in 5.2, a product shall be factory-built as a complete assembly and shall include all the essential components necessary for its intended function when installed (used) as intended. The product may be shipped from the factory as two or more subassemblies.

5.2 A product may be shipped from the factory unassembled, or disassembled to the degree necessary to facilitate shipment, when all of the following conditions are met:

- a) All of the parts are furnished by the manufacturer;
- b) Upon assembly, grounding continuity is provided where required between the field-assembled components;
- c) The product is constructed so that the field assembly can be accomplished without requiring drilling, cutting, threading, or any other alteration other than the attachment of field-installed electrical conduit or raceway;
- d) The relationship between separate parts is established at the time of manufacture, and is not dependent upon installation personnel;
- e) Detailed step-by-step installation instructions are packed with the product, or in the case of multiple product assembly, an installation practice may be used;
- f) Protective guards and other features intended to reduce the risk of fire are factory installed wherever possible.

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6 Enclosure

6.1 General

6.1.1 An enclosure shall have the strength and rigidity necessary to resist the abuses to which the product is likely to be subjected during intended use without increasing the:

- a) Risk of fire, electric shock, or injury to persons due to total or partial collapse, with resulting reduction of spacings to less than required and
- b) Loosening, displacement, or exposure of parts, or other defects.

6.1.2 An enclosure or guard of metal shall have a minimum thickness as specified in Table 6.1 or 6.2, whichever applies.

Table 6.1
Minimum thickness of sheet metal for electrical enclosures – carbon steel or stainless steel

Table 6.1 revised May 14, 2004

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a				Minimum thickness			
Maximum width, ^b		Maximum length, ^c		Maximum width, ^b		Maximum length, ^c		Uncoated,	
cm	(inches)	cm	(inches)	cm	(inches)	cm	(inches)	mm	(inch)
10.2	4.0	Not limited		15.9	6.25	Not limited		0.51	0.020 ^d
12.1	4.75	14.6	5.75	17.1	6.75	21.0	8.25		
15.2	6.0	Not limited		24.1	9.5	Not limited		0.56	0.026 ^d
17.8	7.0	22.2	8.75	25.4	10.0	31.8	12.5		
20.3	8.0	Not limited		30.5	12.0	Not limited		0.81	0.032
22.9	9.0	29.2	11.5	33.0	13.0	40.6	16.0		
31.8	12.5	Not limited		49.5	19.5	Not limited		1.07	0.042
35.6	14.0	45.7	18.0	53.3	21.0	63.5	25.0		
45.7	18.0	Not limited		68.6	27.0	Not limited		1.35	0.053
50.8	20.0	63.5	25.0	73.7	29.0	91.4	36.0		
55.9	22.0	Not limited		83.8	33.0	Not limited		1.52	0.060
63.5	25.0	78.7	31.0	88.9	35.0	109.2	43.0		
63.5	25.0	Not limited		99.1	39.0	Not limited		1.70	0.067
73.7	29.0	91.4	36.0	104.1	41.0	129.5	51.0		
83.8	33.0	Not limited		129.5	51.0	Not limited		2.03	0.080
96.5	38.0	119.4	47.0	137.2	54.0	167.6	66.0		
106.7	42.0	Not limited		162.6	64.0	Not limited		2.36	0.093
119.4	47.0	149.9	59.0	172.7	68.0	213.4	84.0		
132.1	52.0	Not limited		203.2	80.0	Not limited		2.74	0.108
152.4	60.0	188.0	74.0	213.4	84.0	261.6	103.0		
160.0	63.0	Not limited		246.4	97.0	Not limited		3.12	0.123
185.4	73.0	228.6	90.0	261.6	103.0	322.6	127.0		

^a A supporting frame is a structure of angle or channel or a folded rigid section of sheet metal which is rigidly attached to and has essentially the same outside dimensions as the enclosure surface and which has sufficient torsional rigidity to resist the bending moments which may be applied via the enclosure surface when it is deflected. Construction that is considered to have equivalent reinforcing may be accomplished by designs that will produce a structure which is as rigid as one built with a frame of angles or channels. Construction considered to be without supporting frame includes:

- 1) Single sheet with single formed flanges (formed edges);
- 2) A single sheet which is corrugated or ribbed, and

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Table 6.1 Continued

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a				Minimum thickness	
Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	Uncoated, mm (inch)	Metal coated, mm (inch)
3) An enclosure surface loosely attached to a frame, for example, with spring clips. ^b The width is the smaller dimension of a rectangular sheet metal piece which is part of an enclosure. Adjacent surfaces of an enclosure may have supports in common and be made of a single sheet. ^c For panels which are not supported along one side, for example, side panels of boxes, the length of the unsupported side shall be limited to the dimensions specified unless the side in question is provided with a flange at least 12.7 mm (1/2 inch) wide. ^d Sheet steel for an enclosure intended for outdoor use (rain resistant) is required to be not less than 0.91 mm (0.036 inch) in thickness when zinc coated and not less than 0.81 mm (0.032 inch) in thickness when uncoated.							

Table 6.2

Minimum thickness of sheet metal for electrical enclosures – aluminum, copper, or brass

Table 6.2 revised May 14, 2004

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a				Minimum thickness,	
Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	Maximum width, ^b cm (inches)	Maximum length, ^c cm (inches)	mm	(inch)
7.6	3.0	Not limited	17.8	7.0	Not limited		
8.9	3.5	10.2	4.0	21.6	8.5	24.1	9.5 0.58 0.023 ^d
10.2	4.0	Not limited	25.4	10.0	Not limited		
12.7	5.0	15.2	6.0	26.7	10.5	34.3	13.5 0.74 0.029
15.2	6.0	Not limited	35.6	14.0	Not limited		
16.5	6.5	20.3	8.0	38.1	15.0	45.7	18.0 0.91 0.036
20.3	8.0	Not limited	48.3	19.0	Not limited		
24.1	9.5	29.2	11.5	53.3	21.0	63.5	25.0 1.14 0.045
30.5	12.0	Not limited	71.1	28.0	Not limited		
35.6	14.0	40.6	16.0	76.2	30.0	94.0	37.0 1.47 0.058
45.7	18.0	Not limited	106.7	42.0	Not limited		
50.8	20.0	63.5	25.0	114.3	45.0	139.7	55.0 1.91 0.075
63.5	25.0	Not limited	152.4	60.0	Not limited		
73.7	29.0	91.4	36.0	162.6	64.0	198.1	78.0 2.41 0.095
94.0	37.0	Not limited	221.0	87.0	Not limited		
106.7	42.0	134.6	53.0	236.2	93.0	289.6	114.0 3.10 0.122
132.1	52.0	Not limited	312.4	123.0	Not limited		
152.4	60.0	188.0	74.0	330.2	130.0	406.4	160.0 3.89 0.153

^a A supporting frame is a structure of angle or channel or a folded rigid section of sheet metal which is rigidly attached to and has essentially the same outside dimensions as the enclosure surface and which has sufficient torsional rigidity to resist the bending moments which may be applied via the enclosure surface when it is deflected. Construction that is considered to have equivalent reinforcing may be accomplished by designs that will produce a structure which is as rigid as one built with a frame of angles or channels. Construction considered to be without supporting frame includes:

- 1) Single sheet with single formed flanges (formed edges),
- 2) A single sheet which is corrugated or ribbed, and
- 3) An enclosure surface loosely attached to a frame, for example, with spring clips.

^b The width is the smaller dimension of a rectangular sheet metal piece which is part of an enclosure. Adjacent surfaces of an enclosure may have supports in common and be made of a single sheet.

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Table 6.2 Continued on Next Page



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Table 6.2 Continued

Without supporting frame ^a				With supporting frame or equivalent reinforcing ^a				Minimum thickness, mm (inch)
Maximum width, ^b cm (inches)		Maximum length, ^c cm (inches)		Maximum width, ^b cm (inches)		Maximum length, ^c cm (inches)		
^c For panels which are not supported along one side, for example, side panels of boxes, the length of the unsupported side shall be limited to the dimensions specified unless the side in question is provided with a flange at least 12.7 mm (1/2 inch) wide.								
^d Sheet steel for an enclosure intended for outdoor use (rain resistant) is required to be not less than 0.91 mm (0.036 inch) in thickness when zinc coated and not less than 0.81 mm (0.032 inch) in thickness when uncoated.								

6.1.3 A conductive coating applied to a nonmetallic surface such as the inside surface of an enclosure, shall comply with the appropriate requirements in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C, unless it can be determined by investigation that flaking or peeling of the coating cannot result in the reduction of spacings or the bridging of live parts that may present a risk of electric shock or fire.

6.1.4 A communications-circuit accessory intended for outdoor use shall be provided with a weather resistant cover or enclosure and shall comply with the Rain Test, Section 42. When constructed of polymeric material, rubber, or the like, the accessory shall also comply with the tests described in the Weatherometer and Tensile Test, Section 43, and the Thermal Aging and Flame Test, Section 44.

6.1.5 A door or cover that is accessible from the outside of the enclosure and gives access to a resettable or replaceable overload protective device, shall be hinged or secured such that it is unlikely to be detached during servicing.

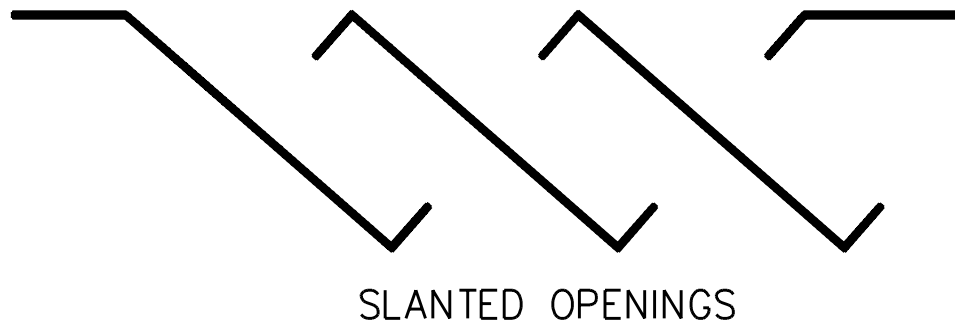
Exception No. 1: A door or cover that, by its function or size, obviously must be in place when the product is to operate as intended, need not be hinged or secured.

Exception No. 2: When a product complies with the requirements in Accessibility and Electric Shock, Section 8, with the door or cover removed, the door or cover need not be hinged or secured.

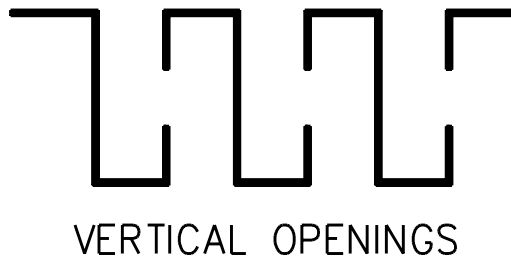
6.2 Enclosure top openings

6.2.1 An enclosure top opening or an opening directly over an uninsulated live part involving a risk of fire, electric shock, or electrical-energy/high-current level, shall not exceed 4.8 mm (0.19 inch) for any dimension unless the configuration is such that a vertically falling object cannot fall into the unit and contact an uninsulated live part. See Figure 6.1 for examples of top enclosure designs which may be used.

Figure 6.1
Cross sections of top-cover designs



EC500



6.3 Enclosure side openings

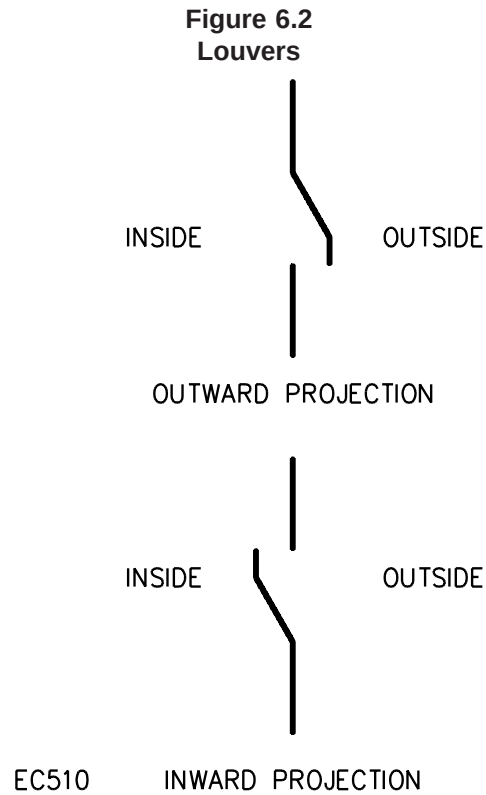
6.3.1 An opening in the side of the enclosure shall:

- a) Not exceed 4.8 mm (0.19 inch) in any dimension; or
- b) Be provided with louvers shaped to deflect an external falling object outward (see Figure 6.2 for examples of louver designs which may be used); or
- c) Be located and sized so that objects that may be present cannot fall into the unit and drop (with no horizontal velocity) onto uninsulated live parts involving a risk of fire, electric shock, electrical-energy/high-current levels or injury to persons.

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6.3.2 When a portion of a side panel falls within the area traced out by the 5-degree angle in Figure 6.3, that portion of the side panel shall be investigated as a bottom enclosure in accordance with 6.4.1 and 6.4.2.