

UL 355

Cord Reels





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Revisions: This Standard contains revisions through and including November 7, 2007.

Summary of Topics

These revisions to ANSI/UL 355 are being issued to address universal upkeep of UL Standards for Safety. These revisions are considered to be non-substantive and not subject to UL's STP process.

Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revisions dated November 7, 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.

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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 cord reels for general use, as well as cord reels – herein referred to as special-use cord reels – intended to be mounted on or in electrical utilization equipment such as appliances, portable lamps, or similar equipment. These cord reels are intended for use in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements also cover reels for use in factories, household workshops, garages, commercial facilities and construction sites where an additional degree of protection against the risk of the entrance of water, dust or other contaminants might be needed.

1.3 These requirements also cover cord reels for use above but not in hazardous locations in commercial garages as defined in the National Electrical Code, NFPA 70.

1.4 A cord reel, as covered by these requirements, is a reel equipped with, or intended for use with, a length of flexible cord. The reel provides a means for the cord to be unwound by the user as desired. The reel is provided with a take-up mechanism, by which the cord is rewound on the reel. The mechanism by which the cord is extended or retracted to the desired length might or might not be driven by a motor. A latch is provided in some cases to restrain the action of a spring take-up mechanism while the cord reel is in use.

2 Glossary

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

2.2 BRUSH – The part, which is mounted on the fixed part of the cord reel or the rotating hub, that conveys the current to the slip ring.

2.3 COMMERCIAL/INDUSTRIAL USE CORD REEL – A cord reel subject to severe use in factories, commercial garages, construction sites, and similar locations requiring a harder service type cord.

2.4 CORD STORAGE DEVICE – A spool for storage of insulated flexible cord but does not enclose or support uninsulated live parts.

2.5 CORD REEL – A device used to store insulated flexible cord with allowance for variable lengths of cord to be extracted from the reel or spool.

2.6 GENERAL-USE INDOOR CORD REEL – A cord reel for use only in indoor, dry, residential type applications.

2.7 GENERAL-USE OUTDOOR CORD REEL – A cord reel that is acceptable for use outdoors as well as indoors in residential applications. The cord reel is intended to be stored indoors when not in use.

2.8 RETRACTION, AUTOMATIC – Retraction by inherent force, such as by spring tension, to position the cord back onto the spool of the cord reel.

2.9 RETRACTION, MANUAL – Retraction by the user, such as by hand cranking action, to position the cord back onto the spool of the cord reel.

2.10 SLIP RING – The part, which is mounted on the fixed part of the cord reel or the rotating hub, that is the circular conductor on which the brush rides.

2.11 SPOOL – The part that the cord is wrapped on when the cord is stored on the cord reel.

2.12 SPECIAL-USE CORD REEL – A cord reel for use only permanently on or in electrical utilization equipment such as appliances, portable lamps, or similar equipment.

3 General

3.1 Components

3.1.1 Except as indicated in 3.1.2, 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 generally used in the products covered by this standard.

3.1.2 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.

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

3.1.4 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.

3.2 Units of measurement

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

3.3 Undated references

3.3.1 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.

CONSTRUCTION

ALL CORD REELS

4 General

4.1 A cord reel shall be formed and assembled so that the cord reel has the strength and rigidity necessary to resist the abuses to which the cord reel is subjected in service, without increasing the risk of fire, electric shock, or injury to persons due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts, or other serious defects.

4.2 The construction and the mechanical functioning of a cord reel shall be such that the cord will not be subjected to abrasion, kinking, pinching, jamming, or other treatment that might damage the cord conductors or insulation.

5 Enclosure

5.1 Wiring terminals that will be inside an outlet box or the equivalent when the reel is installed need not be additionally enclosed.

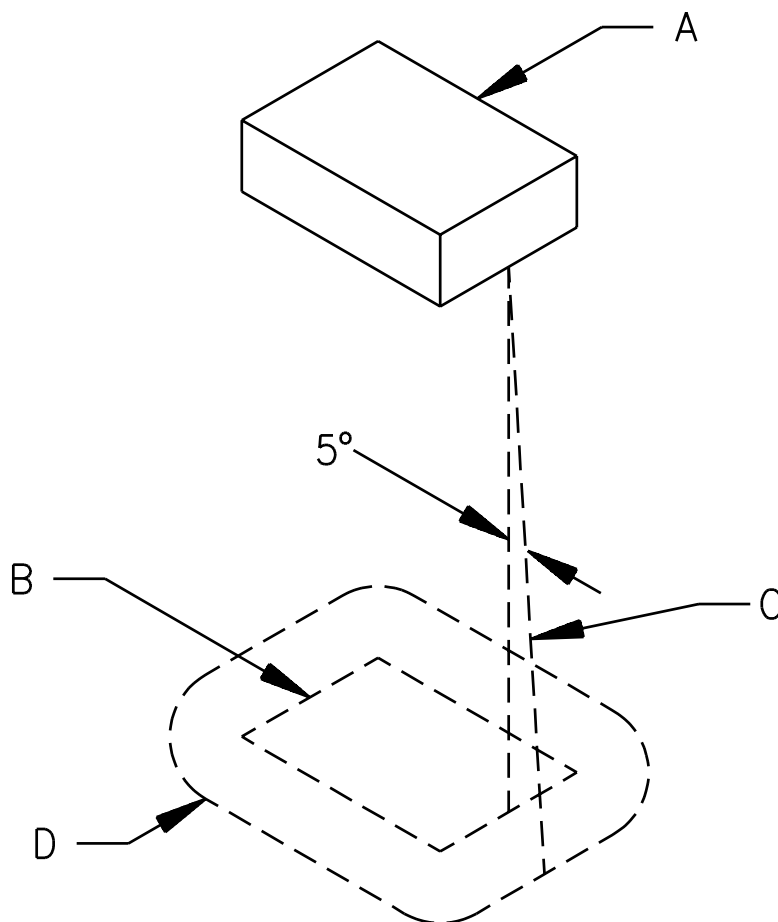
5.2 The enclosure of a cord reel provided with a motor shall prevent molten metal, burning insulation, flaming particles, or similar objects from falling on flammable materials, including the surface upon which the product is supported.

5.3 The requirement in 5.2 will necessitate the use of a barrier of nonflammable material under a motor unless:

- a) The structural parts of the motor or of the product provide the equivalent of such a barrier;
- b) The protection provided with the motor is such that no burning insulation or molten material falls to the surface that supports the product when the motor is energized under each of the following fault conditions:
 - 1) Open main winding,
 - 2) Open starting winding,
 - 3) Starting switch short-circuited, and
 - 4) Capacitor of permanent-split capacitor motor short circuited – the short-circuit is to be applied before the motor is energized, and the rotor is to be locked;
- c) The motor is provided with a thermal motor protector – a protective device that is sensitive to temperature and current – that will prevents the temperature of the motor windings from exceeding 125°C (257°F) under the maximum load under which the motor will runs without causing the protector to cycle and from exceeding 150°C (302°F) with the rotor of the motor locked; or
- d) The motor complies with the requirements for impedance-protected motors in the Standard for Overheating Protection for Motors, UL 2111, and the temperature of the motor winding does not exceed 150°C during the first 72 h of operation with the rotor of the motor locked.

5.4 The barrier specified in 5.3 shall be horizontal, shall be located as indicated in Figure 5.1, and shall not have an area less than that described in the illustration. Openings for drainage, ventilation, and similar functions in the barrier, are acceptable, provided such openings are located so that molten metal, burning insulation, or similar objects do not fall on flammable material.

Figure 5.1
Location and extent of barrier



SA0604-1

NOTES –

A – Region to be shielded by barrier. This will consist of the entire component if it is not otherwise shielded and will consist of the unshielded portion of a component that is partially shielded by the component enclosure or equivalent.

B – Projection of outline of component on horizontal plane.

C – Inclined line that traces out minimum area of barrier. The line is always:

- 1) Tangent to the component,
- 2) 5 degrees from the vertical, and
- 3) Oriented so that the area traced out on a horizontal plane is maximum.

D – Location (horizontal) and minimum area for barrier. The area is that included inside the line of intersection traced out by the inclined line C and the horizontal plane of the barrier.

6 Accessibility of Uninsulated Live Parts and Film-Coated Wire

6.1 To reduce the risk of unintentional contact that involves a risk of electric shock from an uninsulated live part or film-coated wire, an opening in an enclosure shall comply with either (a) or (b).

- a) For an opening that has a minor dimension (see 6.5) less than 1 in (25.4 mm), such a part or wire shall not be contacted by the probe illustrated in Figure 6.1.
- b) For an opening that has a minor dimension of 1 in or more, such a part or wire shall be spaced from the opening as specified in Table 6.1.

Exception: These requirements do not apply to a motor, other than one used in either a hand-held product or a hand-supported portion of a product, if the motor complies with the requirements in 6.2.

6.2 With respect to a part or wire as mentioned in 6.1 in an integral enclosure of a motor as mentioned in the Exception to 6.1:

- a) An opening that has a minor dimension (see 6.5) less than 3/4 in (19.1 mm) is acceptable if:
 - 1) Film-coated wire cannot be contacted by the probe illustrated in Figure 6.3;
 - 2) In a directly accessible motor (see 6.6), an uninsulated live part cannot be contacted by the probe illustrated in Figure 6.1; and
 - 3) In a indirectly accessible motor (see 6.6), an uninsulated live part cannot be contacted by the probe illustrated in Figure 6.2.
- b) An opening that has a minor dimension of 3/4 in or more is acceptable if a part or wire is spaced from the opening as specified in Table 6.1.

Table 6.1
Minimum acceptable distance from an opening to a part that may involve a risk of electric shock

Minor dimension ^a of opening, in (mm) ^b	Minimum distance from opening to part, in (mm) ^b
3/4 ^c (19.1)	4-1/2 (114.0)
1 ^c (25.4)	6-1/2 (165.0)
1-1/4 (31.8)	7-1/2 (190.0)
1-1/2 (38.1)	12-1/2 (318.0)
1-7/8 (47.6)	15-1/2 (394.0)
2-1/8 (54.0)	17-1/2 (444.0)
d	30 (762.0)

^a See 6.5.
^b Between 3/4 in and 2-1/8 in, interpolation is to be used to determine a value between values specified in the table.
^c A dimension less than 1 in applies to a motor only.
^d More than 2-1/8 in, but not more than 6 in (152.0 mm).

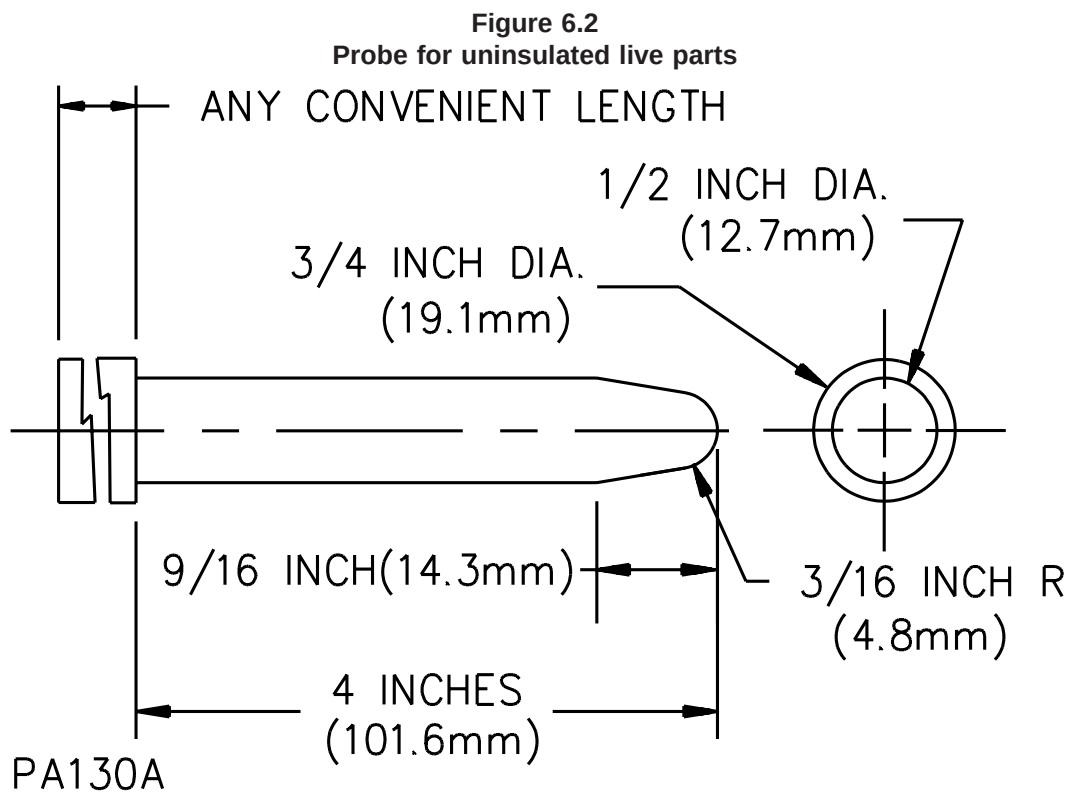
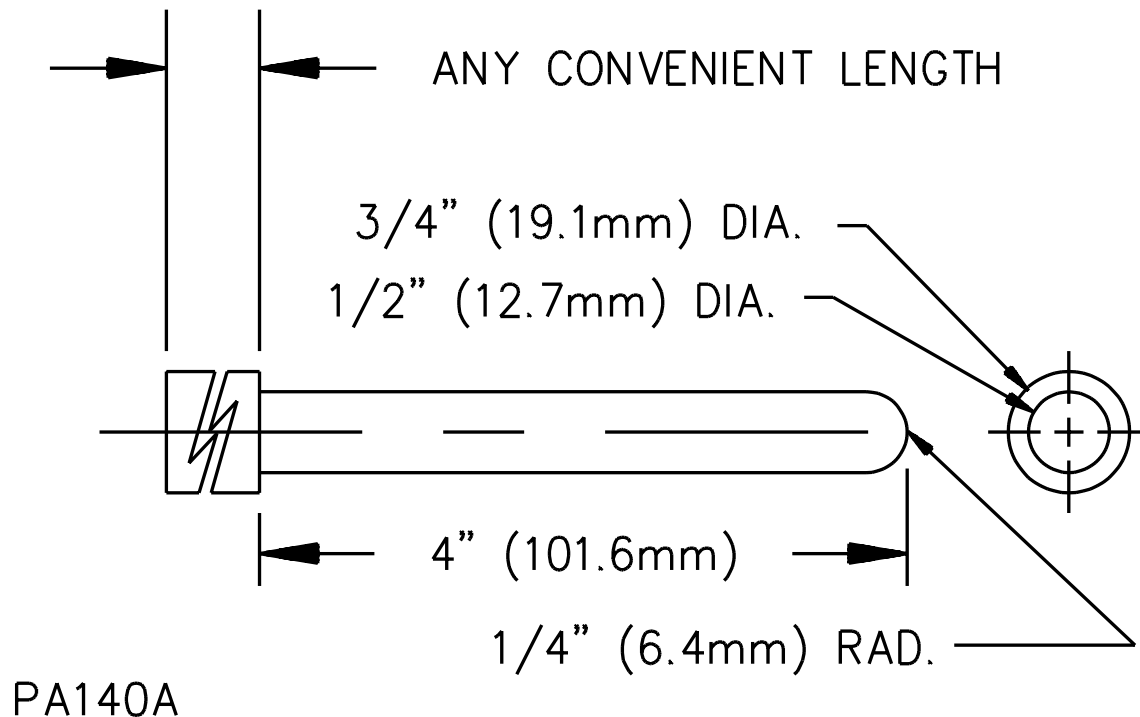


Figure 6.3
Probe for film-coated wire



6.3 The probes mentioned in 6.1 and 6.2 and illustrated in Figures 6.1 – 6.3 shall be applied to any depth that the opening will accommodate, and shall be rotated or angled before, during, and after insertion through the opening to any position that is necessary to examine the enclosure. The probe illustrated in Figure 6.1 shall be applied in any possible configuration; and if necessary, the configuration shall be changed after insertion through the opening.

6.4 The probes mentioned in 6.1 – 6.3 shall be used as measuring instruments to determine the accessibility provided by an opening, and not as instruments to determine the strength of a material. The probes are to be applied with the minimum force necessary to determine accessibility.

6.5 With reference to 6.1 and 6.2, the minor dimension of an opening is the diameter of the largest cylindrical probe having a hemispherical tip that can be inserted through the opening.

6.6 With reference to 6.2,

a) An indirectly accessible motor is a motor:

- 1) Accessible only by opening or removing a part of the outer enclosure, such as a guard or panel, that can be opened or removed without using a tool, or
- 2) Located at such a height or otherwise guarded or enclosed so that the motor is unlikely to be contacted.

b) A directly accessible motor is a motor:

- 1) That can be contacted without opening or removing any part, or

- 2) Located so as to be accessible to contact.

6.7 During the examination of a product to determine compliance with 6.1 or 6.2, a part of the enclosure that can be opened or removed by the user without using a tool (to attach an accessory, to make an operating adjustment, or for other reasons) is to be opened or removed.

6.8 With reference to 6.1 and 6.2, insulated brush caps are not required to be additionally enclosed.

7 Means for Mounting

7.1 A cord reel shall not be provided with means for permanent mounting if the reel is intended to be connected to the power supply by a means of flexible cord with an attachment plug. For this type of construction, the source of supply is connected at the hub of the cord reel. See 16.3.

Exception: A general-use cord reel provided with a flexible cord and attachment plug provided with a means for permanent mounting is acceptable if the flexible cord complies with 13.4.

7.2 The requirement in 7.1 does not preclude the permanent mounting of a special-use cord reel connected to the power supply by means of the retractable flexible cord. A cord terminated with an attachment plug is acceptable if the reel is also provided with means for permanent connection to the load, for example, a cord reel mounted on a mobile appliance. For this type of construction, the source of supply is connected at the unspooled cord.

7.3 With reference to 7.1, a keyhole slot, a notch, a hanger hole, or a hanger ring 1/2 in (12.7 mm) or larger in diameter is not considered to be a means for permanent mounting. If a hanger ring is employed, the hanger ring shall form a complete loop after the cord reel is mounted as intended. A separate bracket intended for permanent attachment to a wall or other surface, to which the cord reel might be attached by a removable swivel pin or similar device, is not considered to be a means for permanent attachment.

Revised 7.3 effective January 23, 2006

7.4 A cord reel that is intended for permanent connection to the power supply shall be provided with means for permanent mounting.

8 Bonding

8.1 All exposed dead-metal parts of a cord reel:

- a) Intended for permanent connection to the power supply shall be bonded to the point on the reel to which the supply system will be connected, and to the equipment-grounding terminal or lead if such is provided on the reel.

Exception: This requirement does not apply to a dead-metal part of a load-end fitting of a reel employing a 2-wire cord.

- b) Intended to be connected to the power supply by a cord employing an equipment-grounding conductor shall be bonded to the equipment-grounding conductor, or to the terminal to which the equipment-grounding conductor will be connected if the cord is to be field installed.