



UL 363

Underwriters Laboratories Inc. Standard for Safety

Knife Switches



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UL Standard for Safety for Knife Switches, UL 363

Eleventh Edition, Dated August 12, 2011

SUMMARY OF TOPICS

This new edition of ANSI/UL 363 is being issued as a periodic re-issuance to ensure that UL's Standards remain up-to-date with regard to format and editorial issues such as renumbering, organization, and other miscellaneous editorial revisions as well as to obtain ANSI recognition.

The new requirements are substantially in accordance with Proposal(s) on this subject dated April 15, 2011.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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Knife Switches

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August 12, 2011

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The most recent designation of ANSI/UL 363 as an American National Standard (ANSI) occurred on August 12, 2011. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

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 open knife switches for use in accordance with the National Electrical Code, ANSI/NFPA-70.

1.2 These requirements cover switches with or without fuseholders; switches having individual bases intended for either front or rear wiring connection; and switch parts without bases intended for mounting on switchboards and panelboards. Switches may be single- or multi-pole and with or without quick-break or auxiliary contacts, except where such contacts are specifically required.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with requirements for that component.

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.

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.

CONSTRUCTION

5 General

5.1 A knife switch (including all parts) shall have the mechanical integrity to resist the abuses likely to be encountered during intended service.

6 Bases – Insulating Material

6.1 A base for mounting uninsulated live parts shall be of an insulating material that is mechanically strong, moisture-resistant, and as resistant to combustion as the materials mentioned in 6.2. The material shall be capable of withstanding the most severe conditions likely to be met in service.

6.2 Porcelain, slate, marble, phenolic composition, and cold-molded composition are acceptable for supporting an uninsulated live part.

6.3 A base of slate, marble, or porcelain shall not be less than 1/2 inch (12.7 mm) thick.

6.4 A material other than those mentioned in 6.2 may be used for supporting an uninsulated live part provided it demonstrates equivalent properties.

6.5 Unimpregnated fiber, rubber, and so-called hot-molded shellac and tar composition are not acceptable for supporting an uninsulated live part.

6.6 Insulating material, including barriers between live parts of opposite polarity, and material that may be in the arc path formed by the opening of the switch, shall be acceptable for the particular application. See 11.6 and 11.7.

6.7 A base shall have not less than two holes for mounting screws. A base with an area of more than 25 in² (161 cm²) shall have three or more holes for mounting screws. In any case, a mounting-screw hole shall be so located or counter-sunk that there is a spacing of not less than 1/2 inch (12.7 mm) over the surface of the insulating material between the head of the screw or washer and the nearest uninsulated live part. A mounting-screw hole located between uninsulated live parts of opposite polarity shall be countersunk unless barriers, or the equivalent, keep the screw head from being in the path of a possible arc between such live parts.

6.8 Live screw heads or nuts on the underside of a base shall be countersunk not less than 1/8 inch (3.2 mm) in the clear, and then covered with a waterproof, insulating, sealing compound which does not soften at a temperature 15°C (27°F) higher than the temperature observed at the point where it is used, but not lower than 65°C (149°F) in any case.

Exception: Parts that are staked, upset, or otherwise prevented from loosening may be insulated from the mounting surface by material other than sealing compound or by the provision of a spacing through air from the mounting surface of not less than 1/2 inch (12.7 mm).

7 Current-Carrying Parts

7.1 Except for plated No. 10 (4.8 mm diameter) and larger wire-binding screws, nuts, and stud terminals, iron or steel (plain or plated) shall not be used for parts that are depended upon to carry current. Plated iron or steel screws, nuts, and stud terminals, if not depended upon to carry current, may be used with soldering lugs and pressure-wire connectors.

7.2 Copper and brass are not acceptable for the plating of steel wire-binding screws, nuts, and stud terminals, but a plating of cadmium or zinc is acceptable.

7.3 Bolts, washers, and nuts at the hinges of knife switches are considered to be parts that are not depended upon to carry current.

7.4 Silver, copper, or a copper-base alloy is acceptable for current-carrying parts. Such parts may be of other metal provided an investigation demonstrates that the metal is acceptable for the particular application. Switch blades and jaws shall be of copper, but terminal parts and mounting pieces of a switch rated at 60 A or less may be of brass.

7.5 If brass is used instead of copper for any current-carrying parts, consideration is to be given to the fact that the resistance of brass is from two to four times that of copper.

7.6 All current-carrying parts shall have ample metal to provide mechanical strength and comply with the temperature requirement in 13.1.

7.7 A knife switch complies with the requirement in 7.6 if current-carrying parts are so proportioned that the current density is not greater than 1000 A/in² (155 A/cm²) of cross section for commercially pure copper, and if the current density at clamped or bolted contacts is not greater than 200 A/in² (31.0 A/cm²). The current density for contact surfaces of blades and jaws is not to be greater than 75 A/in² (11.6 A/cm²).

7.8 A knife switch having current densities at surface contacts greater than indicated in 7.7 may have other means (such as positive pressure at contact surfaces) to reduce heating, if such means demonstrates equivalent performance.

7.9 A break jaw, a hinge jaw, a fuse contact, or a metal part carrying or holding such a part, shall be securely and rigidly fastened to the supporting base or mounting surface and shall be prevented from turning or shifting in position by means other than friction between surfaces. This may be accomplished by one of the following:

- a) Two screws or rivets;
- b) Square shoulders or mortises;
- c) A dowel pin, lug, or offset;
- d) A connecting strap or clip fitted into an adjacent part; or
- e) By some other equivalent method.

7.10 If parts are held together by screws, a threaded part shall have not less than two full, clean-cut threads, not finer than American National Standard threads, where the screw passes entirely through the piece. If the screw does not pass entirely through the threaded part, it shall engage full, clean-cut threads for a distance of not less than the diameter of the screw.

7.11 If a break jaw, hinge jaw, or fuse contact is held in a slot or hole milled in a mounting piece, the parts shall fit together closely and shall comply with Table 7.1, and Figures 7.1 and 7.2.

Table 7.1
Securing of jaws and contacts

Construction		Rating in amperes	Means of securing
Slotted, See 7.1		100 or less	Pinning required, soldering not acceptable
		over 100	Pinning and soldering required
Milled Opening, see 7.2.	Jaw or contact securely swaged on the underside of the mounting piece.	100 or less	Pinning soldering, or both acceptable but neither is required
		over 100	Soldering required, additional pinning acceptable but not required
	Jaw or contact not securely swaged on the underside.	Any	Pinning and soldering required