



UL 1429

STANDARD FOR SAFETY

Pullout Switches

UL Standard for Safety for Pullout Switches, UL 1429

Fourth Edition, Dated April 18, 2000

SUMMARY OF TOPICS

This revision of ANSI/UL 1429 dated December 4, 2020 includes the following changes:

Barriers to address inadvertent contact on line side of service disconnect; Section [18A](#), [Table 49.1](#) and [49.5.7](#).

Editorial updates; [9.2](#), [11.2.1](#), [11.2.2](#), [17.2](#), [20.5](#), [26.3](#), and [37.2](#).

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.

These new and revised requirements are substantially in accordance with Proposal(s) on this subject dated August 28, 2020.

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Standard for Pullout Switches

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April 18, 2000

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The most recent designation of ANSI/UL 1429 as an American National Standard (ANSI) occurred on December 4, 2020. 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 non-enclosed and enclosed pullout switches of the detachable type.
- 1.2 These requirements cover pullout switches rated 600 V or less, 400 A or less, with or without horsepower ratings, and with or without high-available fault current ratings.
- 1.3 These requirements cover pullout switches mounted in complete enclosure. Such an enclosure may contain meter sockets or neutral assemblies or both.
- 1.4 These requirements also cover enclosed pullout switches intended for use as service equipment.
- 1.5 These requirements cover non-enclosed pullout switches for use as mains and branches in panelboards, switchboards, and the like.
- 1.6 This standard does not cover hinged pullout switches. Such switches are covered in the Standard for Enclosed and Dead-Front Switches, UL 98.
- 1.7 These requirements do not cover enclosed pullout switches containing more than one independent switch which are covered by the Standard for Panelboards, UL 67.
- 1.8 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of 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.

4 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 pullout switch shall employ materials throughout that are acceptable for the particular use.

5.2 All parts of a pullout switch shall be assembled in place when the switch is shipped from the factory, except as noted in [5.3](#).

5.3 A pullout switch may have provision for factory or field-installed accessories, such as neutral assemblies, provided that:

- a) The pullout switch is for use with or without such assemblies,
- b) Each accessory is acceptable for the intended use,
- c) Each accessory can be installed without the disassembly of factory-assembled parts and without the use of a special tool unless such a tool and instructions for its use are furnished with each accessory,
- d) A barrier that is necessary because spacings would otherwise be less than required, or for any other reason, is securely attached at the factory to either the switch or to the accessory to be installed,
- e) The accessory is an essentially complete unit and does not require detailed assembly in the field. An arrangement that requires cutting, splicing of existing wires, or resoldering of connections is not acceptable, and
- f) The accessory and switch are marked in accordance with [49.6.1](#).

5.4 With reference to [5.3](#), screws for mounting the neutral assembly must be furnished with that assembly but need not be assembled in place.

5.5 A Class CTL pullout switch shall have a size or configuration that, in conjunction with the physical means provided in a Class CTL panelboard, prevents the installation of more switch poles than that number for which the assembly is designed and rated.

5.6 Live parts of the fuse, including the fuse ferrules, shall not be relied upon to perform the switching function of a pullout switch.

6 Enclosure

6.1 General

6.1.1 An overall enclosure shall comply with the Standard for Enclosures for Electrical Equipment, UL 50, except for modifications and additional requirements as specially described in this Standard.

6.1.2 The entire enclosure of a switch intended for surface mounting and the box proper of a switch intended for flush mounting may be formed of sheet steel not less than 0.042 inch (1.07 mm) thick, excluding any coating thickness, if:

- a) The length does not exceed 18 inches (457 mm) and the width does not exceed 14 inches (356 mm),
- b) No surface of the box proper has an area of more than 252 square inches (1626 cm²),
- c) The depth of the box proper is not more than 5 inches (127 mm), and
- d) The thickness of a cover, front, door, trim and the like, provided as part of an enclosure intended for flush mounting is as specified in Table 15.1 of the Standard for Enclosures for Electrical Equipment, UL 50.

6.1.3 The enclosure of a pull-out switch shall enclose completely all current-carrying parts, whether dead or alive, when a detachable pull-out member is closed. A pull-out switch member shall be so constructed that no live part will be exposed to unintentional contact by the operator when the pull-out switch member is in any position. See Operating Mechanism, Section [8](#).

6.1.4 The enclosure shall include a deadfront shield that will allow access to a switch handle without exposing live parts of the wiring.

6.1.5 A deadfront shall be supported independently of any support that will be provided by units that may be field-installed. The deadfront shall be so constructed that it can be readily installed and removed without the likelihood of contacting an uninsulated live part or injuring the insulation of any insulated live part inside the enclosure.

6.1.6 An enclosed pullout switch marked with a Type 3S enclosure designation in addition to complying with the requirements in UL 50 shall have an operating mechanism, if such is provided, that will support the additional weight of the ice and withstand removal of ice by a hand tool to gain access to the interior of the enclosure. Auxiliary means may be provided to break the ice and to provide for operation of an external mechanism.

6.1.7 An enclosed pullout switch marked with a Type 3S enclosure designation after the Icing Test in UL 50 is considered to be acceptable, if while ice loaded, the external operating mechanism can be operated manually or as intended by one person without damage to the enclosure. If an auxiliary mechanism is provided to break the ice, it shall be used. A separate icing test is to be conducted for each maintained position of each operator.

6.1.8 An enclosed pullout switch marked with a Type 12 or 12K enclosure designation, in addition to complying with the requirements in UL 50, shall have no holes other than for a Type 12 mechanism, or equivalent, that is provided with an oil resistant gasket.

6.1.9 If knockouts are provided in the enclosure of a switch, they may be of any size; but at least two of them (or more when multiple conduits are involved) shall be so located that the installation of bushings will not result in spacings between live parts and bushings of less than the minimum requirements of this standard, when they are reamed to accommodate the size of conduit required for the maximum number of

gauge of rubber-insulated wires necessitated by the switch rating. This requirement is not intended to prohibit the use of enclosed switches connected to other wiring systems described in the National Electrical Code, ANSI/NFPA No. 70.

6.2 Doors and covers

6.2.1 A door shall be provided to cover a fusible detachable pullout member in the case of an enclosed pullout switch. The door shall be hinged, sliding, or similarly attached so as to prevent its being removed inadvertently.

6.2.2 The door over a fusible detachable pullout switch member in an enclosed pullout switch shall comply with requirements for doors, hinges, and latches as given in the Standard for Enclosures for Electrical Equipment, UL 50.

7 Bases – Insulating Material

7.1 A base for the mounting of uninsulated live parts shall be of strong, not easily ignited moisture-resistant insulating material that is acceptable for the particular application. The base shall be so constructed that it will withstand the most severe conditions likely to be met in service.

7.2 A neutral bus bar is considered to be a live part and shall be mounted on a base that complies with [7.1](#).

Exception: A neutral need not be insulated from dead metal parts when the switch is marked only for use as service equipment. See [49.5.2](#).

7.3 Insulating material, including barriers between parts of opposite polarity or material that may be subject to the influence of the arc formed by the opening of the switch, shall be acceptable for the particular application.

7.4 Live screw heads or nuts on the underside of a base intended for surface mounting shall be countersunk not less than 1/8 inch (3.2 mm) in the clear, and then covered with a waterproof insulating, sealing compound that will 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; except that if such parts are staked, upset, or otherwise kept from loosening, they 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).

7.5 A lock washer, properly applied, is acceptable as a means of preventing the loosening of a screw or nut as required in [7.4](#).

7.6 A determination of the softening point of a sealing compound is to be made in accordance with the Test for Softening Point by Ring and Ball Apparatus, ASTM E28.

8 Operating Mechanism

8.1 The operating mechanism shall be constructed in such a manner as to provide the strength and rigidity necessary to perform its intended function. Screws and nuts serving to attach operating parts to crossbars or other movable members shall be staked, upset, or otherwise locked in position to keep them from loosening under the jars of continued use.

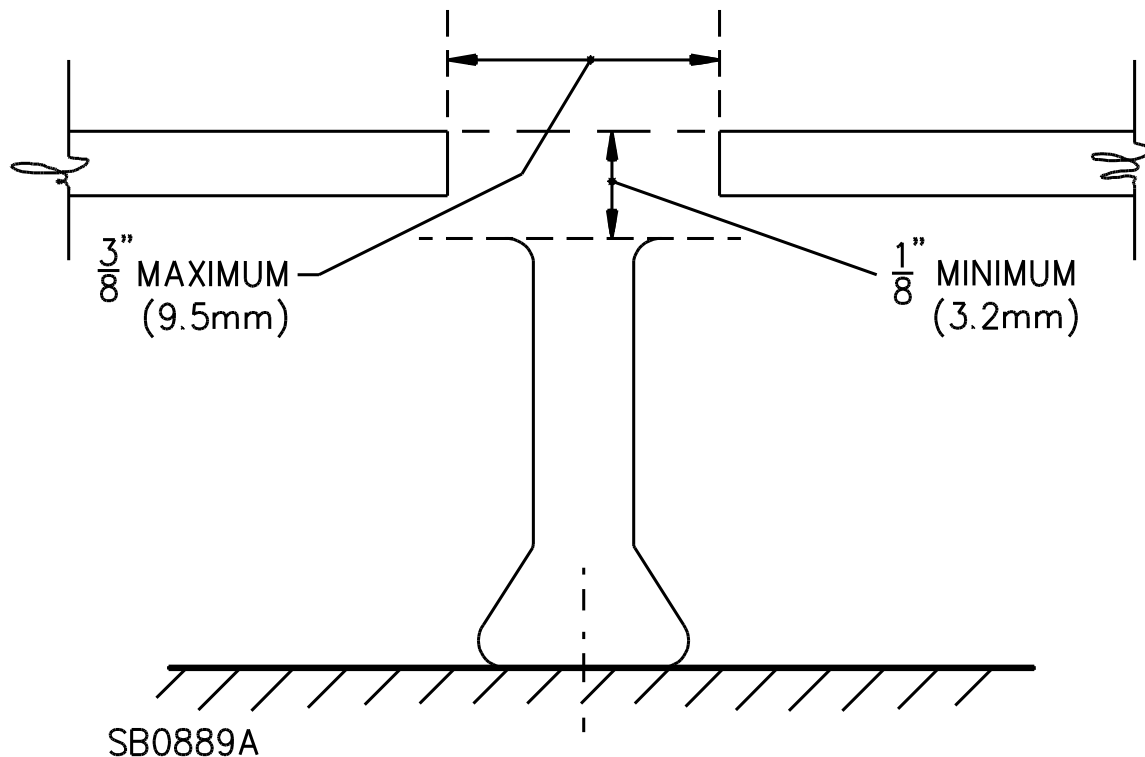
8.2 The accessibility of a live part with respect to unintentional contact as mentioned in [6.1.3](#) is to be determined with reference to any actual operating condition and with the pull-out member tilted at any

angle at which it can be inserted. If the protection of a live part against unintentional contact is accomplished by means of a shield, barrier, or the like that may be moved or deflected under pressure so as to affect either the width of the opening or the recessing of the live part, the dimensions specified are to be investigated with the expected pressure applied.

8.3 A live part is not considered to be exposed to unintentional contact if it is recessed or set back $\frac{1}{8}$ inch (3.2 mm) or more from the plane of an opening having at least one dimension not greater than $\frac{3}{8}$ inch (9.5 mm), as shown in [Figure 8.1](#). An opening, the smallest dimension of which is more than $\frac{3}{8}$ inch (9.5 mm) but not more than $\frac{11}{16}$ inch (17.5 mm), is acceptable if the live part is recessed no less than twice the difference between such opening dimension and $\frac{5}{32}$ inch (4.0 mm).

8.4 There shall be no interference between the recessed ends of the recessed female contact and the male blade of a removable member that will stop insertion of blades of the removable member at any angle of approach permitted by the construction.

Figure 8.1
Recessing of live parts



8.5 In a fusible pullout switch which has a fuse mounting means as an integral part of the detachable pullout switch member, the member shall not be insertable in a holder for a detachable pullout switch member of the same manufacturer that has a lower current rating. Detachable pullout switch members shall not be interchangeable with members intended to accept a different class of fuse.

Exception No. 1: A Class H fuseholder may also accept a Class K or a Class R fuse.

Exception No. 2: Detachable pullout switch members may be interchangeable with members intended to accept different classes of fuses if,

a) Interchangeability is limited to fuses having the same ampere rating, voltage rating, and short circuit rating, and

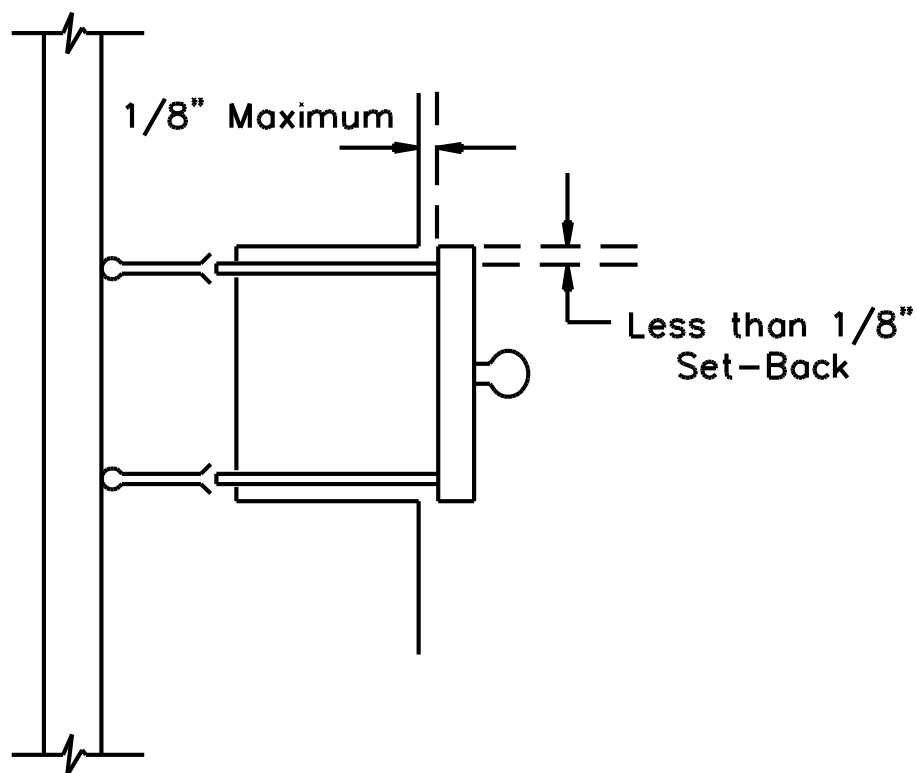
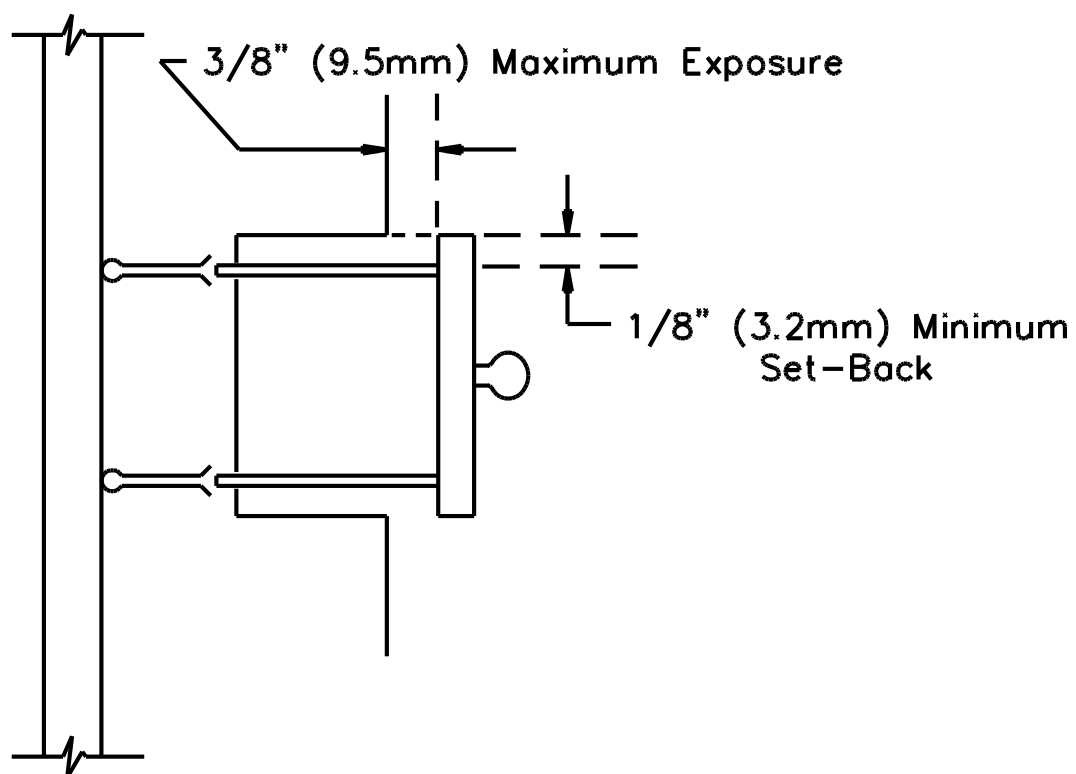
b) The pullout switches have been short-circuit tested for the maximum value of I^2t and I_p of any of the fuses to be used.

8.6 In a non-fusible pullout switch, a detachable pullout switch member shall not be insertable in a holder for a detachable pullout switch member of the same manufacturer that has a higher current rating.

8.7 With respect to [Figure 8.2](#), the dimensions specified in [8.3](#) apply also to live parts on a pullout member under any conditions of contact between the blades on the pullout member and the stationary switch contacts.

Exception: The blades or other current-carrying parts may be recessed or set back less than 1/8 inch (3.2 mm) if their exposure while live is not more than 1/8 inch.

Figure 8.2
Recessing of pullout switch



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8.8 A handle shall be provided for manipulation of the switch.

8.9 A pullout switch shall be of a type that indicates whether the circuit is open or closed. There shall be an "off" position with the pullout member installed in the base. When the pullout member is installed in the "off" position, it shall be retained in place by the door, when the door is closed and latched or other means shall be provided to retain the pullout member in place. Removal of fuses shall not be depended on to accomplish the "off" position. See [49.2.1](#).

Exception: The off position may be accomplished by removing a detachable pullout member of an enclosed pullout switch and storing it inside the enclosure. See [49.2.1](#).

9 Disconnecting Means

9.1 An enclosed pullout switch that has provision for the connection of a grounded service conductor and that does not interrupt the grounded conductor, shall, if marked to indicate that it is acceptable for use as service equipment, be provided with means for disconnecting the grounded service conductor from the load conductors.

9.2 The required disconnecting means may be a link, screw, or similar conducting piece intended to make connection between two terminals. It may be a terminal plate provided with wire connectors or lugs or with wire binding screws and upturned lugs for clamping a 10 AWG (5.3 mm²) or smaller wire; it may be a single stud provided with wire connectors or lugs, or with nuts and cupped washers for clamping a 10 AWG or smaller wire; or it may be a wire connector that is intended for the connection of a single conductor and also for the connection of two conductors. See also [9.7](#).

9.3 Where the disconnecting means is a removable link or a switching neutral pole, the provisions for connection of the grounding electrode conductor and the main bonding jumper shall be on the line side of the disconnect link or switching neutral pole.

9.4 An enclosed pullout switch marked as being acceptable for use as service equipment and rated for alternating current shall have provision for connection of the grounding electrode conductor to the grounded service conductor. The size of the grounding electrode conductor shall be assumed to be in accordance with [Table 18.1](#). A soldering lug or other connection means that depends upon solder shall not be used.

9.5 The provision for connection of the grounding-electrode conductor mentioned in [9.4](#) shall be on the neutral, if a neutral is provided.

Exception: The provision may be on the equipment-grounding terminal assembly, bus, or the like if the main bonding jumper is a bus bar or wire and is connected directly from the neutral to the equipment-grounding terminal assembly.

9.6 An enclosed pullout switch that is marked for service equipment use and rated for alternating current shall have a terminal for a grounded service conductor even though there may be no provision for a load conductor to be connected to the grounded service conductor. If there is no provision for such a load conductor, the grounded service conductor terminals shall:

- a) Accommodate a conductor of the same size as the main bonding jumper specified in [Table 18.1](#),
- b) Be bonded to the enclosure, and
- c) Be directly connected to the grounding electrode conductor terminal.

Exception: The terminals may be omitted if the enclosed switch is marked as covered in [49.7.7](#).

9.7 A single wire connector may be employed for the disconnecting means between the grounded load conductor and the grounded service conductor, as well as the connection of the grounding electrode conductor, provided the grounded load conductor can be removed without disturbing any other conductors.

10 Overcurrent Protection

10.1 Pullout switches shall be provided with a fuseholder for each ungrounded conductor.

Exception: Fuseholders are not required if the marking in accordance with [49.8.1](#) is provided.

10.2 Fuseholders shall not be arranged for accommodating fuses in parallel.

10.3 There shall be no fuseholder in series with any conductor that is intentionally grounded.

11 Current-Carrying Parts

11.1 General

11.1.1 A current-carrying part shall be of silver, silver alloy, copper, a copper alloy, aluminum, and aluminum alloy, or other metal acceptable for the application, and shall be adequately rigid. The ampacity of current-carrying parts such as neutrals, interconnecting bus bars, or wiring, where not otherwise specified in these requirements, shall be investigated under the requirements of the Standard for Panelboards, UL 67.

11.1.2 Except for plated No. 10 (4.8 mm diameter) and larger wire-binding screws and 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.

11.1.3 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.

11.1.4 An aluminum part shall be plated at joints with nickel, tin, silver or cadmium.

Exception: Plating is not required at welded or brazed joints.

11.1.5 Uninsulated live parts, other than soldering lugs or pressure wire connectors as mentioned in [14.12](#), shall be so secured to the mounting surface that they will be kept from turning.

11.1.6 Friction between surfaces is not acceptable as a means to prevent turning of uninsulated live parts. Turning may be prevented by the use of two screws or rivets; by shoulders or mortises; by a dowel pin, lug, or offset; by a connecting strap or clip fitted into an adjacent part; or by some other equivalent method.

11.1.7 Where parts are held together by screws, a threaded part shall not have less than two full, clean-cut threads, not finer than the American standard threads given in [Table 11.1](#), if 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.

Table 11.1
Machine-screw threads

American National Standard screw size (mm diameter)	Maximum number of threads per inch (per 25.4 mm)
1/4 (6.8)	20
12 (5.5)	24
10 (4.8)	32
8 (4.2)	32
6 (3.5)	36

11.1.8 If a break 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 [Figure 11.1](#).

Figure 11.1
Securing of jaws and contacts

Construction	Rating in amperes	Means of securing
	100 or less	Pinning required, soldering not acceptable
	Over 100	Pinning and soldering required
 Jaw or contact securely swaged on the under-side 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
	Any	Pinning and soldering required
Jaw or contact not securely swaged on the under-side		

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11.1.9 A neutral may be switched. An unswitched (solid) neutral may be mounted on the switch base or on a separate base.

11.2 Wiring terminals

11.2.1 Except as noted in [11.2.4](#) and [11.2.5](#), a pullout switch shall be provided with wiring terminals for the connection of conductors having an ampacity not less than the current rating of the device; and the terminals of a switch having a horsepower rating shall be capable of accommodating conductors having an ampacity equal to 125 percent of the motor-running current corresponding to the horsepower rating (see [16.2](#)). A wiring terminal shall be provided with a pressure wire connector; except that a wire-binding screw may be employed at a wiring terminal intended for the connection of a 10 AWG (5.3 mm²) or smaller conductor if upturned lugs or the equivalent are provided to retain the conductor under the head of the screw when the screw is loosened enough to enable shifting of the conductor.

11.2.2 A wiring terminal provided for the connection of a service conductor to an enclosed pullout switch marked for service equipment use and rated 30 A or less shall be acceptable for use with a 8 AWG (8.4 mm²) copper conductor. The terminal shall be acceptable for use with a 6 AWG (13.3 mm²) aluminum conductor if the enclosed switch is marked for use with aluminum wire.

11.2.3 The sizes of field installed conductors having ampacities as referenced in [11.2.1](#) shall be determined from [Table 11.3](#) based on:

- a) The use of aluminum wire at all terminals, except those terminals identified for use with copper wire only.
- b) The use of wire rated 75°C (167°F) for all wire sizes 1/0 AWG and larger.
- c) The use of wire rated 60°C (140°F) for all wire sizes 1 AWG and smaller, except that if the switch is marked only for 75°C wire at any terminals in accordance with [49.7.18](#), conductor size shall be based on the use of wire rated 75°C at those terminals.

11.2.4 Pressure terminal connectors for field connection (line or load) need not be provided if the following conditions are met:

- a) Component terminal assemblies shall be available from the equipment manufacturer or one or more acceptable pressure terminal connectors shall be specified for field installation on the equipment,
- b) Fastening devices, such as studs, nuts, bolts, spring washers and flat washers, as required for an effective installation shall either be provided as part of the component terminal assembly or be mounted on or separately packaged with the equipment.
- c) The installation of the terminal assembly shall not involve the loosening or disassembly of parts other than a cover or other part giving access to the terminal location.
- d) If the pressure terminal connector provided in a component terminal assembly requires the use of a special tool for securing the conductor, any necessary instructions shall be included in the component assembly packaged or with the equipment.
- e) Installation of the pressure terminal connectors in the intended manner shall result in a product meeting the requirements of this standard.
- f) The equipment shall be marked in accordance with [49.7.1](#).

11.2.5 A terminal may be omitted if the switch is specifically intended to be used with such other equipment that the terminal is unnecessary.

11.2.6 A soldering lug or other connection that depends upon solder shall not be provided for the connection of the service conductors or the service grounding conductor to an enclosed pullout switch marked as acceptable for use as service equipment.

Table 11.3
Ampacity of insulated conductors^{a,b}

Wire size		60°C (140°F)		75°C (167°F)	
AWG	mm ²	Copper	Aluminum	Copper	Aluminum
14	2.1	15	—	15	—
12	3.3	20	15	20	15
10	5.3	30	25	30	25
8	8.4	40	30	50	40
6	13.3	55	40	65	50
4	21.2	70	55	85	65
3	26.7	85	65	100	75
2	33.6	95	75	115	90
1	42.4	110	85	130	100
1/0	53.5			150	120
2/0	67.4			175	135
3/0	85.0			200	155
4/0	107			230	180
MCM					
250	127			255	205
300	152			285	230
350	177			310	250
400	203			335	270
500	253			380	310
600	304			420	340
700	355			460	375
750	380			475	385
800	405			490	395
900	456			520	425

^a For a multiple-conductor connector at a terminal, the value is to be multiplied by the number of conductors that the terminal will accommodate (1/0 AWG or larger).

^b These values of ampacity apply only if not more than 3 conductors will be field-installed in the conduit. If 4 or more conductors, other than a neutral that carries the unbalanced current, will be installed in a conduit (as may occur because of the number of conduit hubs provided in an outdoor switch, because of the number of wires necessary in certain polyphase systems, or other reasons) the ampacity of each of those conductors is 80 percent of the value given in the table if 4 – 6 conductors are involved, and 70 percent of that value if 7 – 24 conductors.

11.2.7 A wiring terminal provided for the connection of a grounded neutral conductor or an electrode grounding conductor shall be readily accessible so that the wires can be disconnected after installation.

11.2.8 If conductors of the next larger size than that described in [11.2.3](#) can be inserted into the terminals of a pullout switch, the terminals shall be capable of securing such larger conductors, unless marked as provided in [49.7.21](#).

11.2.9 A pressure wire connector that is not intended to be removable or interchangeable shall be capable of receiving and holding properly the range of wire sizes with which the switch is intended to be used.

11.2.10 With reference to the requirement in [11.2.9](#), the range of wire sizes with which an ampere-rated switch may be used is considered to correspond to the range of fuse sizes accommodated by the switch. For a switch having both ampere and horsepower ratings, the range of wire sizes is considered to include those acceptable for the ampere rating and also the wire sizes acceptable for the horsepower ratings at which the switch can be used; except that a connector need not be acceptable for all the horsepower ratings less than the maximum if acceptable markings show the range of acceptable wire sizes.

11.2.11 A pressure wire connector provided with or specified for use with a pullout switch shall comply with the applicable requirements for wire connectors and soldering lugs, as outlined in the Standard for Wire Connectors and Soldering Lugs for Use With Copper Conductors, UL 486A, for Wire Connectors for Use With Aluminum Conductors, UL 486B, or the Standard for Equipment Wiring Terminals for Use With Aluminum and/or Copper Conductors, UL 486E.

11.2.12 The tightening torque for a field-wiring terminal shall be as specified by the switch manufacturer and shall be marked as required by [49.7.17](#). The specified tightening torque shall not be less than 90 percent of the value employed in the static heating test as specified in the Standard for Wire Connectors and Soldering Lugs For Use With Copper Conductors, UL 486A, the Standard for Wire Connectors for Use With Aluminum Conductors, UL 486B, or the Standard for Equipment Wiring Terminals for Use With Aluminum and/or Copper Conductors, UL 486E, for that wire size corresponding to the ampere rating of the switch. See [31.1](#).

Exception: Torque value may be less than 90 percent if the connector is investigated in accordance with UL 486A, UL 486B, or UL 486E, using the lesser assigned torque value.

11.2.13 If the screw-and-washer construction is employed at a wiring terminal, the binding screw shall not be smaller than No. 10 (4.8 mm diameter), with not more than 32 threads per inch (per 25.4 mm).

11.2.14 A terminal plate tapped for a wire-binding screw shall be of metal not less than 0.050 inch (1.27 mm) thick and shall have not less than two full threads in the metal; except that a special alloy plate less than 0.050 inch (1.27 mm) but not less than 0.030 inch (0.76 mm) thick may be accepted if the tapped threads have enough mechanical strength.

11.2.15 A terminal plate may be extruded at the tapped hole so as to give the thickness necessary for at least two full threads, provided that the thickness of the unextruded metal is not less than the pitch of the thread.

11.2.16 A wire-binding screw shall not thread into material other than metal.

11.2.17 The point of attachment of a soldering lug, a pressure wire connector, or a wire-binding screw terminal shall not overhang the base unless the construction is such as to provide enough mechanical strength so that there will not be any reduction of required spacings.

12 Equipment Grounding Terminals

12.1 An enclosed pullout switch shall be provided with a means for terminating line and load equipment-grounding conductors sized in accordance with [Table 12.1](#).

Exception No. 1: An enclosed pullout switch marked in accordance with [49.7.3](#) or [49.7.4](#) need not have the equipment grounding means provided.

Exception No. 2: For an enclosed pullout switch marked in accordance with [49.5.2](#), a terminal for connection of the grounding electrode conductor provided in accordance with [9.4](#) may be considered to be the line equipment-grounding conductor means if it is acceptable for the wire size specified in [Table 12.1](#).