

## Chapter E 380

## SWITCHES

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## A. INSTALLATION

**E 380.01 Grounded conductors.** No switch or circuit-breaker shall disconnect the grounded conductor of a circuit unless the switch or circuit-breaker simultaneously disconnects the ungrounded conductor or conductors, or unless the switch or circuit-breaker is so arranged that the grounded conductor cannot be disconnected until the ungrounded conductor or conductors have first been disconnected.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.02 Three-way and four-way switches.** Three-way and four-way switches shall be so wired that all switching is done only in the ungrounded circuit conductor. Wiring between switches and outlets shall, where in metal enclosures, be run with both polarities in the same enclosure.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.03 Enclosures.** Switches and circuit-breakers shall be of the externally-operable type enclosed in metal boxes or cabinets, except pendant and surface type snap switches and knife switches mounted on an open face switchboard or panelboard.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.04 Wet locations.** A switch or circuit-breaker in a wet location or outside of a building shall be enclosed in a weatherproof enclosure or cabinet installed to conform to section E 373.02. ✓

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.05 Time switches, flashers, and similar devices.** Time switches, flashers, and similar devices need not be of the externally-operable type. They shall be enclosed in metal boxes or cabinets except:

- (1) EXCEPTION No. 1. Where mounted on switchboards or control panels.
- (2) EXCEPTION No. 2. Where enclosed in approved individual housings.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.06 Position of knife switches.** Single-throw knife switches shall be so placed that gravity will not tend to close them. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal as preferred, but where the throw be vertical a locking device shall be provided which will insure the blades remaining in the open position when so set.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.07 Connection of knife switches.** Knife switches, unless of the double-throw type, shall be so connected that the blades are dead when the switch is in the open position.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.08 Accessibility and grouping.** Switches and circuit breakers, so far as practicable, shall be readily accessible and shall be grouped. See section E195.21.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.09 Covers of flush snap switches.** Flush snap switches, that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces, shall be provided with covers of non-conducting, non-combustible material. Metallic faceplates shall be of ferrous metal not less than 0.030 inch in thickness or of non-ferrous metal not less than 0.040 inch in thickness. Faceplates of insulating material shall be non-combustible and not less than 0.10 inch in thickness but may be less than 0.10 inch in thickness if formed or reinforced to provide adequate mechanical strength.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.10 Mounting of surface-type snap switches.** Snap switches used with open wiring on insulators shall be mounted on sub-bases of insulating material which will separate the conductors at least  $\frac{1}{2}$  inch from the surface wired over.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.11 Circuit-breakers as switches.** A circuit-breaker operable directly by applying the hand to a lever or handle may serve as a switch provided it has the number of poles required for such switch.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.12 Grounding of enclosures.** Enclosures for switches or circuit-breakers on circuits of over 150 volts to ground shall be grounded in the manner specified in chapter E 250, except where accessible to qualified operators only.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.13 Knife switches.** (1) Knife switches rated for more than 1200 amperes at 250 volts or less, and for more than 600 amperes at 251 to 600 volts, shall be used only as isolating switches and shall not be opened under load.

(2) To interrupt currents greater than 1200 amperes at 250 volts or less, or 600 amperes at 251 to 600 volts, a circuit-breaker or a switch of special design approved for such purpose shall be used.

(3) Knife switches of lower rating may be used as general-use switches and may be opened under load.

(4) Motor-circuit switches (see definition) may be of the knife-switch type.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.14 Rating of snap switches.** Snap switches installed for the following types of loads shall be rated as follows:

(1) **NON-INDUCTIVE LOADS.** For non-inductive loads other than tungsten-filament lamps, switches shall have an ampere rating not less than the ampere rating of the load.

(2) **TUNGSTEN FILAMENT LOADS.** For tungsten filament lamp loads and for combined tungsten filament and non-inductive loads, switches shall be "T" rated or, where on alternating-current circuits, may be a general use alternating-current snap switch.

(a) Exception. A switch that is not "T" rated may be installed to control such loads provided all 3 of the following qualifications are satisfied:

1. Where switches are used in branch circuit wiring systems in private homes; in rooms in multiple-occupancy dwellings used only as living quarters by tenants; in private hospital or hotel rooms; or in similar locations but not in public rooms or places of assembly; and

2. Only where such a switch controls permanently connected fixtures or lighting outlets in one room only, or in one continuous hallway where the lighting fixtures may be located at different levels, or on porches or in attics or basements not used for assembly purposes; and

3. The switch is rated at not less than 10A, 125V; 5A, 250V; or for the 4-way types, 5A, 125V; 2A, 250V.

(3) **INDUCTIVE LOADS.** Switches controlling inductive loads shall have an ampere rating twice the ampere rating of the load unless they are of a type approved as part of an assembly or for the purpose employed. On alternating-current circuits, general use alternating-current snap switches may be used to control inductive loads other than motors not exceeding the ampere rating of the switch.

*Note 1.* For switches on signs and outline lighting, see section E 600.02.

*Note 2.* For switches controlling motors, see sections E 430.083 and E 430.110.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

## B. CONSTRUCTION SPECIFICATIONS

**E 380.15 Marking.** Switches shall be marked with the current and voltage and, if horsepower rated, the maximum rating for which they are designed.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.16 600-Volt knife switches.** Auxiliary contacts of a renewable or quick-break type or the equivalent, shall be provided on all 600-volt knife switches designed for use in breaking currents over 200 amperes.

*Note:* It is recommended that such auxiliary contacts be provided on all direct-current switches rated at over 250 volts.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.

**E 380.17 Multiple fuses.** Switches rated above 600 amperes may be arranged for fuses in multiple provided as few fuses as possible are used and the fuses are of the same type and rating and are so mounted as to eliminate a potential difference between the terminals of the fuses.

**History:** Cr. Register, April, 1964, No. 100, eff. 5-1-64.