

SECTION 26 28 16 - DISCONNECT SWITCHES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Disconnect switches, safety switches, elevator shunt trip disconnect switches.

1.2 REFERENCES

- A. Switches shall be manufactured in accordance with the following standards:
 1. UL 98 - Enclosed and Dead Front Switches
 2. NEMA KS 1 - Enclosed Switches
 3. NEMA 250 - Enclosures for Electrical Equipment

1.3 SERVICE ENTRANCE

- A. Switches identified for use as service equipment are to be labeled for this application.

1.4 SUBMITTALS

- A. Provide outline drawings with dimensions, and equipment ratings for voltage, amperage, horsepower and short circuit.
- B. Submit listing of all types, sizes and quantity of fuses which will be installed including the location of each.
- C. Elevator shunt trip disconnect switches shall be submitted with all applicable options selected. Include wiring diagrams for controls.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Safety Switches shall be manufactured by Square D, Eaton, or G.E.
- B. Elevator shunt trip switches shall be manufactured by Cooper Bussmann, Eaton, or Littelfuse.

2.2 DISCONNECT SWITCHES FOR MOTORS AND GENERAL USE

- A. SWITCH INTERIOR
- B. All switches shall have switch blades which are visible when the switch is OFF and the cover is open. [Type 1, 3R, 4-4X-5 stainless steel, 4X polyester, 12, 12K].
- C. Lugs shall be Listed for 75° C.
- D. Switches required for Type 12, 12K or Type 4-4X-5 stainless steel applications shall have all copper current carrying parts.
- E. All current carrying parts shall be plated to resist corrosion.

- F. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.
- G. Switches shall have provisions for a field installable electrical interlock.
- H. When a Safety Switch is installed between a VFD and the motor, it shall contain an Auxiliary Contact. The Aux Contact shall be wired into the VFD safety Circuit to shut the VFD off before the switch opens, and not allow it to start before the Safety Switch is closed.

I. SWITCH MECHANISM

- J. Switch operating mechanism shall be quick-make, quick-break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
- K. The operating handle shall be an integral part of the box, not the cover, [Type 1, 3R, 4-4X-5 stainless steel 4X polyester, 12, 12K]
- L. Provisions for padlocking the switch in the OFF position with at least three padlocks shall be provided.
- M. The handle position shall travel at least 90° between OFF and ON positions to clearly distinguish and indicate handle position, [Type 1, 3R, 4-4X-5 stainless steel, 4X polyester, 12, 12K].
- N. All switches [Type 1, 3R, 4-4X-5 stainless steel, 4X polyester, 12, 12K] shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is ON and prevent turning the switch ON when the cover is open. The cover interlock mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

O. SWITCH ENCLOSURES

1. The enclosure shall be finished with [gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated steel (Type 1)], [gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvanized steel (Type 3R, 12, 12K)], [A brush finish on type 304 stainless steel (Type 4-4X-5 stainless steel)], [Gray baked enamel on copper free cast aluminum alloy (Type 7/9)].
 2. The enclosure shall have ON and OFF markings [stamped into the cover (Type 1, 3R, 4-4X-5 stainless steel, 12, 12K)], [Cast into the cover (Type 7/9)], [Inked on a adhesive label (Type 4X polyester)]
 3. All switches shall have provisions to accept up to three 3/8 in hasp padlocks to lock the operating handle in the OFF position.
 4. Tangential knockouts shall be provided to facilitate ease of conduit entry [Type 1, 3R, 12K] for switches rated 30-200A.
- A. Type 12 and 4-4X-5 stainless steel enclosure shall contain no knockouts. Supply watertight hubs as indicated on the plans.
 - B. Type 4X polyester enclosures shall be provided with polyester conduit hubs for field installation.
 - C. Type 7/9 enclosures shall be provided with threaded conduit openings in both endwalls.
 - D. Enclosures for Type 3R switches through 200 ampere shall have provisions for interchangeable bolt-on hubs in the top endwall. Hubs shall be sized as indicated on the plans.

- E. Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor applications.
- F. Type 12, 4-4X-5 stainless steel enclosures shall be dual rated as Type 3R to facilitate their use in outdoor applications.

G. SWITCH RATINGS

- H. Switches shall be horsepower rated for AC and/or DC as indicated on the plans.
- I. Switches shall be rated "Heavy Duty" except when used as required as primary disconnecting means for DDC control panel power conditioners.
- J. The UL Listed short circuit current rating of the switches shall be 200,000 rms symmetrical amperes.

K. ELEVATOR SHUNT TRIP DISCONNECT

- L. Provide shunt trip disconnect switch in a single NEMA enclosure with all necessary relay(s), control transformer and other options (as listed below), and as shown on drawings. The disconnect switch shall be constructed, listed and certified to the standards as listed above. The disconnect switch shall have an ampere rating as shown on the Contract Drawings, and shall include a horsepower rated fusible switch with shunt trip capabilities. The amp rating of the switch shall be based upon elevator manufacturer requirements and utilize Class J Fuses (provided separately). It shall include as an accessory, a 100VA control power transformer with primary and secondary fuses. The primary voltage rating shall equal line voltage, with a 120V secondary. It shall also contain an isolation relay (3PDT, 10 amp, 120V). The coil of the isolation relay shall be 120Vac. A normally open dry contact shall be provided by the Fire Alarm Safety System to energize the isolation relay and activate the shunt trip solenoid (140VA inrush at 120V).

- M. The shunt trip disconnect switch shall contain the following options:

1. Key to Test Switch
2. "ON" Pilot Light (Green)
3. 1P NC Mechanically Interlocked Auxiliary Contact (required for hydraulic elevators with automatic recall)
4. Fire alarm voltage monitoring relay (needed to comply with NFPA 72)
5. Auxiliary contacts, allowing disconnect switch to be turned off for maintenance without sending a supervisory or trouble signal to the fire alarm control panel.
6. 120Vac option shall be selected for fire alarm interface relay.
7. NEMA 1 enclosure

PART 3 - EXECUTION

END OF SECTION 26 28 16

This section of the *U of I Facilities Standards* establishes minimum requirements only.
It should not be used as a complete specification.