

## SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Safety disconnect switches and enclosed circuit breakers.
- B. Related Requirements:
  - 1. 16100 - Wiring Methods.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. National Electrical Manufacturers Association (NEMA).
  - 1. NEMA 250 – Enclosures for Electrical Equipment (1000 volts maximum).

## PART 2 - PRODUCTS

## 2.1 DISCONNECT SWITCHES

- A. Requirements:
  - 1. Furnish and install all disconnect switches required for full code compliance except where switches are furnished with equipment specified in other DIVISIONS of the specifications in which case, install only.
  - 2. Fusible Switch Assemblies: Shall be NEMA KS 1, Type HD (Heavy Duty) horsepower rated, load interrupter switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips shall accommodate Class R unless indicated otherwise. Fusible switches shall be UL rated 200,000 AIC with Class R,J or L fuses.
  - 3. Nonfusible Switch Assemblies: Shall be NEMA KS 1, Type HD (Heavy Duty) load interrupter switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
  - 4. NEMA Type 1 general purpose enclosures shall be used for interior dry locations unless otherwise indicated.
  - 5. NEMA Type 3R raintight enclosures shall be used for exterior locations unless otherwise indicated.
  - 6. Switches controlling or disconnecting motor loads shall be horsepower rated and approved for motor control service except where NEC 430-109 exceptions apply.
  - 7. Line and load terminals of disconnect switches rated 100 amperes or less shall be rated for 75 degrees C.
  - 8. Provide electrical interlock to de-energize control wiring as required.
  - 9. All disconnect switches shall be capable of being locked open.
  - 10. Controller disconnect switches shall be within sight of the controller. If the disconnect switch of any controller is out of site of, or more than 50 feet from, its related motor, then a disconnecting switch shall be added within sight of the motor. The switch at the motor may be deleted only where allowed by the NEC and where approved by the Engineer.
  - 11. Install fuses specified in SECTION 16402 – LOW VOLTAGE SERVICE AND DISTRIBUTION in all fusible switches.
  - 12. Provide adhesive label on inside door of each switch indicating UL fuse class and size for replacement.
  - 13. Switches used for service entrance shall have a UL Service Entrance Label

## 2.2 ENCLOSED CIRCUIT BREAKERS

- A. References:
  - 1. UL489 - Molded Case Circuit Breakers and Circuit Breaker Enclosures.
  - 2. UL50 - Cabinets and Boxes.

3. NEMA 250 - Enclosures for Electrical Equipment.

B. Requirements:

1. Provide enclosed circuit breakers where indicated on the Drawings and as required by the specifications.
2. Circuit breakers shall be molded case, thermal magnetic type unless indicated otherwise on the Drawings.
3. Circuit breakers enclosures shall have an integrated equipment rating suitable for the available fault current.
4. NEMA Type 1 general purpose enclosures shall be used for interior dry locations unless otherwise indicated.
5. NEMA Type 3R raintight enclosures shall be used for exterior locations unless otherwise indicated.
6. Circuit breaker enclosures identified for use as service equipment are to be labeled for Service Entrance application.
7. Circuit breaker operating handles shall be operable from outside of enclosures and shall be capable of being locked in the open position.
8. Reference SECTION 16442 – BRANCH CIRCUIT PANELBOARDS for circuit breaker specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install motor and circuit disconnect in accordance with manufacturer's recommendations. Applicable Codes shall take precedence over drawing details.
- B. Provide properly sized grounding lug and terminations for all disconnect switches.

END OF SECTION