SECTION 16410 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Provide all motor and circuit disconnect switches as required by NEC and as indicated.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and other Division 1 specification sections, apply to this Section and to all Contractors, Subcontractors, or other persons supplying materials and/or labor, entering into the Project site and/or premises, directly, or indirectly.

B. The Specifications and Drawings are intended to be complementary. A particular section, paragraph or heading in a Division may not describe each and every detail concerning work to be done and materials to be furnished. The Drawings are diagrammatic and may not show all of the work required or all construction details. Dimensions are shown for critical areas only; all dimensions and actual placements are to be verified in the field. It is to be understood that the best trade practices of the Division will prevail. It remains the responsibility of the Contactor or Subcontractor to provide all items, equipment, construction, and services required to the proper execution and completion of the Work.

C. Reference listings are provided as a convenience to the Contractor or Subcontractor providing the Work of this Section and may not contain all the requirements affecting this Section. It remains the responsibility of the Contractor or Subcontractor to locate and comply with all requirements of the Contract Documents.

1.03 SUBMITTALS

A. Submit product data in accordance with Section 16010.

B. Submit data including switch or circuit breaker size, voltage, and NEMA rating.

C. Submit dimensional data of all motor and circuit switches or circuit breakers.

D. Submit test results in accordance with Section 16080.

1.04 REGULATORY REFERENCES

A. All specified items or systems shall be designed, manufactured, tested, and installed in compliance with applicable provisions of all governing codes, rules, laws, and ordinances in accordance with Section 16010.

1. If there is a conflict between applicable documents, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents. The Contractor has the responsibility to determine and adhere to all applicable documents and to the most recent release when developing the proposal for installation.

2. This document does not replace any code, either partially or wholly. The Contractor must be aware of local codes that may impact this project.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide products by the following:

1. Disconnect Switches:
   a. Siemens
   b. General Electric
   c. Square D
   d. Cutler-Hammer
2. Circuit Breakers:
   a. Siemens
   b. General Electric
   c. Square D
   d. Cutler-Hammer

B. Substitutions: Items of equal quality, function and performance may be proposed for substitution by following the procedures outlined in Section 16010.

2.02 ENCLOSURES

A. Enclosures shall be fabricated from 16-gauge minimum galvanized or equivalent rust-resistant steel with rust-inhibiting primer and baked-enamel finish.

2.03 DISCONNECT SWITCHES

A. Shall be quick-make, quick-break single-throw externally operated manual type disconnect switches in NEMA 1 enclosure for interior dry use and NEMA 3R for exterior. If indicated on the Drawings, the unit shall be fused according to the protected equipment manufacturers' recommendations.

B. Switches shall be capable of being locked in the open position.

C. Switches shall be heavy-duty type.

D. Where disconnect switches are located on the load side of Variable Frequency Drives (VFDs), switches shall have auxiliary contacts for controls to shut down VFD completely when power is interrupted to the motor. Contact shall be dry and isolated with a contact configuration of SPST. Contact set shall be sealed.

2.04 CIRCUIT BREAKERS

A. Enclosed circuit breakers shall be molded case, bolt-on heavy-duty type having quick-make, quick-break manually-operated toggle mechanism. Handle shall be trip-free with three positions that clearly indicate when the breakers are "on," "off," or "tripped." Multiple-pole circuit breakers shall operate on a common trip principle. All circuit breakers shall provide overcurrent and short-circuit protection.

B. The minimum AIC rating shall be 22,000 amperes, unless otherwise indicated on the Drawings. It shall be the responsibility of the equipment supplier to coordinate all secondary breaker interrupting capacities and to indicate them on applicable submittals.

C. Circuit breakers shall be housed in a NEMA 1 enclosure for dry locations and NEMA 3R for damp or exterior locations.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Surface-mount switches and circuit breakers so as not to interfere with other equipment.

B. Mount according to manufacturer's recommendations, NEC, and Section 16070.

C. Verify exact wall dimensions in field to ensure that standard enclosures specified can be arranged in the space allocated.

D. Provide fuses for all disconnect switches.

End of Section