SECTION 26 28 16
DISCONNECT SWITCHES AND INDIVIDUAL MOTOR CONTROLLERS

PART 1 - **GENERAL**

1.1 DESCRIPTION

A. Provide disconnect switches and individual motor controllers in accordance with the Contract Documents.

1.2 QUALITY ASSURANCE

A. Disconnects and individual motor controllers shall be of the same manufacturer as the switchboards.

1.3 REFERENCE STANDARDS

A. Published specifications standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this Section where cited below:
   1. Federal Standards
      a. W-S-865-C Switch, Box, (Enclosed) Surface-Mounted
   2. NEMA – National Electrical Manufacturers Association
      a. NEMA KS 1-2013 Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum)
      b. NEMA ICS 2 Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts
   3. UL – Underwriters Laboratories Inc.
      a. UL 98 Enclosed and Dead-Front Switches
      b. UL 508 Standard for Industrial Control Equipment
      c. UL 547 Standard for Safety Thermal Protectors for Motors
      d. UL 845 Standard for Safety Motor Control Centers
      e. UL 1004 Standard for Safety Electric Motors

1.4 SUBMITTALS

A. No requirements.

1.5 FIELD TESTING

A. Test each individual motor controller and verify proper operation.

B. Test motors under load and verify proper rotation.

PART 2 - **PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

A. Cutler Hammer, Siemens, or Square D.

2.2 DISCONNECT SWITCHES

A. Heavy duty, horsepower rated, quick-make, quick-break, dead-front type. Self-contained unit in a NEMA 1 gasketed enclosure (NEMA 3R where installed outdoors), externally operable from the front.

B. Defeatable interlock to prevent opening the door when the switch is in the ON position. Handle shall be capable of being padlocked in the OFF position.

C. Fusible switches shall be equipped with rejecting type clips suitable for UL Class R fuses up to 600A, suitable for UL Class L fuses above 600A. Interrupting rating shall be 200,000 RMS-symmetrical amperes.

D. Voltage, ampacity, horsepower rating, and number of poles shall be appropriate for system and load served. Provide neutral pad for circuits with neutral conductors. Provide ground lug.

E. Provide 6 pole switches for connection to motors requiring 6 motor leads.

2.3 THERMAL OVERLOAD/DISCONNECT SWITCH

A. Single-phase manual motor starter with quick-make, quick-break toggle mechanism and field-adjustable overload heater element.

B. Manual motor starters shall be sized for the motors served.

2.4 INDIVIDUAL MOTOR CONTROLLER

A. Self-contained unit in a NEMA 1 gasketed enclosure (NEMA 3R where installed outdoors), externally operable from the front.

B. Provide full voltage non-reversing (FVNR) type combination magnetic starters for motors of ½ HP to 60 HP.

C. Provide reduced voltage, non-reversing, auto-transformer type combination magnetic starters for motors 75 HP and larger.
   1. Two-winding, open delta connected type.
   2. Adjustable timing relay for start-to-run transfer timing.
   3. Closed transition from reduced to full voltage.
   4. Field-adjustable auto-transformer taps: 50 percent, 65 percent and 80 percent. Factory-set at 80 percent.

D. Fusible switch type disconnect with clips for UL Class R type fuses.

E. Provide an individual control power transformer with two primary and one secondary control fuses for each motor controller. The other secondary lead shall be grounded. Secondary voltage shall be 120V AC.

F. Provide each motor controller with three phase, ambient temperature compensating, thermal overload relays with heaters. Overload relays shall be adjustable from 90 percent to 110 percent of heater rating, factory-set at 100 percent. Provide an insulated pushbutton on the outside of door to reset overload relays.

G. Provide each motor controller with a Hand-Off-Automatic (HOA) selector switch. Provide a Hand-Automatic (HA) selector for life safety equipment. Mount switch on outside of door.

H. Provide each motor controller with two normally open and two normally closed auxiliary contacts, green OFF and red RUNNING long life (50,000 hours) pilot indicators on outside of door, auxiliary relays, and other devices required for operation of the equipment to be controlled.

PART 3 - **EXECUTION**

3.1 GENERAL

A. Disconnect switches and individual motor controller shall be installed within ten feet of load served and installed within sight of the motor.

B. Provide independent support; do not mount on the housing of the equipment served.

C. Conduit connected between disconnect switch or individual motor controller and load served shall be liquid-tight flexible metal conduit, 24 inches minimum length, 36 inches maximum length.

D. Each disconnect switch serving smoke control system air handling equipment shall be provided with an integral, internal auxiliary switch which shall be connected to the Fire Management System for status indication of the OPEN/CLOSED status of the disconnect switch.

end of SECTION 26 28 16

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