SECTION 26 29 13
ENCLOSED CONTROLLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manual motor controllers.

B. Magnetic motor controllers.

C. Combination magnetic motor controllers and disconnects.

1.02 RELATED REQUIREMENTS

A. Section 26 05 29 - Hangers and Supports for Electrical Systems.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

C. Section 26 28 13 - Fuses.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated 600 Volts. National Electrical Manufacturers Association; 2000 (R2005). with errata, 2008.

C. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices; National Electrical Manufacturers Association; 2000 (R2010).

D. NEMA ICS 6 - Industrial Control and Systems: Enclosures; National Electrical Manufacturers Association; 1993 (R2011).

E. NEMA KS 1 – Heavy Duty Enclosed and Dead -Front Switches (600 Volts Maximum); National Electrical Manufacturers Association; 2013

F. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2013(NETA STD ATS)

G. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Maintenance Data: Replacement parts list for controllers.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Eaton Corporation; Cutler-Hammer Product: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

2.02 MANUAL CONTROLLERS

A. Manual Motor Controllers: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller with overload element, red pilot light, and push button operator.

B. Fractional Horsepower Manual Controllers: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and key operator.

C. Motor Starting Switches: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, without thermal overload unit, with red pilot light and key operator.

D. Mechanical HVAC and Motor equipment: coordinate switches with equipment. See mechanical drawings.

E. Enclosures: NEMA ICS 6, Type 1.

2.03 AUTOMATIC CONTROLLERS

A. Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.

B. Coil Operating Voltage: 120 volts, 60 Hertz.

C. Overload Relays: NEMA ICS 2; bimetal.

D. Enclosures: NEMA ICS 6, Type 1.

2.04 COMBINATION STARTERS

A. Combination starters shall be magnetic line voltage type with a "Hand-Off-Auto" (H/O/A) selector switch. Combination starters shall be non-reversing type with interchangeable fuse clips, straight-through wiring, three (3) melting alloy thermal overload units, non-welding contacts and shall be mounted in a factory-finished and assembled enclosure or as called for in the Spec. or Drawing. Units shall be fused and sized according to the horsepower, current rating and operating voltage of their respective motors. The coil shall be molded heavy duty with permanent voltage and frequency markings.

B. Mechanical HVAC and Motor equipment: coordinate switches with equipment. See mechanical drawings.

2.05 MAGNETIC MOTOR STARTERS AND ENCLOSURES

A. Motors starters shall be combination type with fusible switch, 3-phase type with non-welding silver alloy contact, molded 115-volt coil with permanent voltage and frequency markings, and 3 melting alloy thermal overload units. The size of starters shall be determined by the size of the motor they are connected to.

B. Enclosures shall be for surface mounting. Where devices are installed in enclosed control panels, they shall be the open type.

C. Mechanical HVAC and Motor equipment: coordinate switches with equipment. See mechanical drawings.

2.06 CONTACTORS (MAGNETIC TYPE)

A. Contactors shall be multi-pole type suitable for switching either heater or motor loads with non-welding silver alloy contacts, molded 115-volt heavy duty coil with permanent voltage and frequency markings. The contact rating shall be determined by the horsepower and current

rating of the device they are connected to. The enclosure shall be for surface mounting. Where devices are installed in enclosed control panel they shall be the open type.

2.07 MASTER RELAY

A. Relay shall be an electromagnetic device, rated at 600 volts AC and equipped with visible contacts. The coil and magnetic assembly shall be the heavy duty, molded type, designed for continuous duty at 120 volts, 60 Hz permanently marked with the frequency and operating voltage. Contact current rating shall be determined by the type of load being switched by the relay. The relay shall have one pole for each serviced equipment. Each pole shall be connected in series with its respective limit control circuit. Relay shall be the open type device if mounted within an enclosed panel or in its own enclosure if surface mounted.

2.08 ACCESSORIES

A. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

B. Pushbuttons: Shielded type.

C. Indicating Lights: Transformer, LED type.

D. Selector Switches: Rotary type.

2.09 DISCONNECTS

A. Combination Controllers: Combine motor controllers with disconnects in common enclosure. Obtain IEC Class 2 coordinated component protection.

B. Thermal Magnetic Circuit Breakers: Integral thermal and instantaneous magnetic trip in each pole; UL listed.

C. Motor Circuit Protector: Circuit breakers with integral instantaneous magnetic trip in each pole; UL listed.

D. Nonfusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable handle.

E. Fusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable handle. Fuse clips: Designed to accommodate Class R fuses.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install enclosed controllers where indicated, in accordance with manufacturer's instructions.

B. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

C. Provide supports in accordance with Section 26 05 29.

D. Height: 5 ft to operating handle.

E. Provide fuses for fusible switches; refer to Section 26 28 13 for product requirements.

F. Select and install overload heater elements in motor controllers to match installed motor characteristics.

G. Mechanical HVAC and Motor equipment: coordinate switches with equipment. See mechanical drawings.

H. Identify enclosed controllers in accordance with Section 26 05 53.

3.02 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 01 40 00.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.16.1.

END OF SECTION