

SECTION 262913.13 - ACROSS-THE-LINE MOTOR CONTROLLERS**PART 1 - GENERAL****1.1 SUBMITTAL REQUIREMENTS****A. Product Data**

1. For each type include manufacturer's technical data on dimensions, features, performance, electrical characteristics, ratings, short circuit current ratings, wiring diagrams, enclosure types and finishes.

PART 2 - PRODUCTS**2.1 GENERAL**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
 1. ABB; Control Products.
 2. Eaton Electrical Inc.; Cutler-Hammer Business Unit
 3. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 4. Rockwell Automation, Inc.; Allen-Bradley brand.
 5. Siemens Industry, Inc.
 6. Square D; a brand of Schneider Electric.
- B. Provide lugs, lug kits and related accessory work as required to accommodate the conductor sizes and quantities needed for each application. Coordinate with single-line diagram, field conditions, etc. Mount as indicated on drawings and as determined in field based on project conditions.
- C. General Requirements for Full-Voltage Controllers: Comply with NEMA ICS 2, general purpose, Class A.
- D. Provide Red pilot light.
- E. Configuration: Non-reversing.

2.2 FULL-VOLTAGE CONTROLLERS

- A. Fractional and Integral Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.
 1. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters and sensors in each phase, matched to nameplate full-load current of actual protected motor and having appropriate adjustment for duty cycle; external reset; melting alloy type.

2. Control relays or auxiliary contact (N.O. (normally-open) or N.C. (normally closed) as applicable), as needed for specified control sequence or monitoring.
- B. Combination Magnetic Controllers: Full voltage, across the line, electrically held, factory-assembled combination of magnetic controller, OCPD (overcurrent protective device), and disconnecting means.
1. Power Contacts: Totally enclosed, double-break, silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
 2. Contactor Coils: Pressure-encapsulated type with coil transient suppressors. Provide with control voltages as required to render the equipment fully operational; coordinate with respective equipment supplier and installer.
 1. Solid-State Overload Relay:
 - a. Switch/dial selectable for motor running overload protection.
 - b. Sensors in each phase.
 - c. Class 20 tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
 2. Reversible N.C./N.O., isolated overload alarm contact.
 3. External overload reset push button.
 4. Fusible Disconnecting Means:
 - a. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate fuses.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - c. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.

2.3 ENCLOSURES

- A. Enclosed Controllers: NEMA ICS 6, to comply with environmental conditions at installed location. Provide factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting, corrosion-resistant primer on treated metal surface.
1. Dry and Clean Indoor Locations: Type 1.
 2. Outdoor Locations: Type 3R
 3. Kitchen, Wash-Down Areas: Type 4X, stainless steel.
 4. Other Wet or Damp Indoor Locations: Type 4.
 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: Type 12.

2.4 ACCESSORY COMPONENTS AND FEATURES

- A. General Requirements for Control Circuit and Pilot Devices: NEMA ICS 5; factory installed in controller enclosure cover unless otherwise indicated.
 - 1. Control Circuits: Coordinate with controlled-equipment installer. Supply through secondary disconnecting devices from CPT, or provide from remotely fed branch circuit. Provide primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits. Provide integral CPT (control power transformer), with primary and secondary fuses with CPT of sufficient capacity to operate integral devices and remotely located pilot, remote interlocked devices, indicating, and control devices. CPT Percent Spare Capacity: 100 VA.
 - 2. Control Interfaces and Pilot Lights: Heavy-duty type.
 - a. Pilot Lights: LED types; colors as indicated.
 - b. Selector Switches: Rotary type.
- B. Reversible (or equivalent) N.C./N.O. auxiliary contact(s).
- C. Cover gaskets.
- D. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- E. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.
- F. Spare control wiring terminal blocks, quantity as indicated.
- G. Provide integral factory-installed power supply system(s) to prevent electronic-trip breakers from tripping under conditions where load current may at any time fall below operational thresholds. Provide factory-wired power supply system(s), powered from the respective MCC with integral overcurrent protection, control power transformer(s), etc. as necessary for complete operational system(s) without requiring any external or field wiring.
- H. Breather and drain assemblies, to maintain interior pressure and release condensation in enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- I. Space heaters, with NC auxiliary contacts, to mitigate condensation in enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- J. Sun shields installed on fronts, sides, and tops of enclosures installed outdoors and subject to direct and extended sun exposure.

- K. Provide barriers required for separating sections compliant with NFPA 70.
- L. Provide construction and bracing as required to permit shipping, rigging, etc. of products in any physical position or orientation without compromising product warranty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide fuses. Provide heaters in thermal-overload relays. Select heaters based on actual nameplate full-load amperes after motors have been installed. Install, connect, and fuse thermal-protector monitoring relays furnished with motor-driven equipment. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- B. Install wiring between controllers and remote devices and facility's control system(s). Bundle, train, and support wiring in enclosures. Connect selector, control and safety devices as applicable, giving priority to safety-type control devices.

END OF SECTION 262913.13