

SECTION 164XX

ENCLOSED FUSED COMBINATION MOTOR CONTROLLERS

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install enclosed combination motor controllers as shown on the drawings.

1.2 Related Sections:

- A. Section 16491 – Fuses

1.3 REFERENCES

- A. Combination magnetic motor controllers shall comply with:
 - 1. NEMA FU 1
 - 2. NEMA KS 1
 - 3. UL 98
 - 4. UL 508

1.4 SUBMITTALS

- A. Drawings: Submit detailed dimensional outline, conduit entry/exit locations, and wiring diagrams/drawings
- B. Product Data: Submit catalog sheets showing voltage, current, horsepower, controller size, type and rating of fused disconnect switch and fuses, termination ratings, and short circuit current ratings.
- C. Provide 10 copies of above.

1.5 CLOSEOUT SUBMITTALS

- A. Final as-built drawings and product data information per Section 1.4
- B. Final report of all field test/inspection/settings
- C. Operation and maintenance manuals including replacement parts list.
- D. Provide 10 copies of above.

1.6 QUALIFICATIONS

- A. Equipment manufacturer shall have a minimum of 5 years experience in manufacturing the products as specified herein.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in a manner that avoids damage.

- B. Equipment shall be inspected prior to installation for damage. Do not install damaged equipment.

1.8 ADDITIONAL MATERIALS

- A. Furnish three sets of each rating and type of fuse installed and spare fuse cabinet where not already provided.

PART 2 PRODUCTS

2.1 FULL-VOLTAGE NON-REVERSING CONTROLLERS

- A. Manufacturers:
 - 1. Square D Model – Class 8538 Type S (NEMA) or D-Line – LE1 (IEC)
 - 2. Cutler-Hammer Model - ECN 16 (NEMA) or ECE 16 (IEC)
 - 3. GE Electrical Model - CR 308 (NEMA) or CL/CK (IEC)
 - 4. Allen-Bradley Model – Bulletin 512 (NEMA) or Bulletin 112 (IEC)
- B. Ratings
 - 1. Equipment shall have a short-circuit current rating of 100,000A minimum.
 - 2. Equipment shall be tested and have documentation verifying compliance with Type 2 protection requirements per UL508E or IEC 60947-4.
- C. Construction
 - 1. Provide fused disconnect switch with lockable operating handle and positive visual indication of on/off positions. Fused disconnect switch shall be equipped with clips for Cooper Bussmann LP-CC, LPN-RK/LPS-RK, or LPJ fuses.
 - 2. Provide magnetic motor controller with overload relay, sized as indicated on drawings. Overload relay shall be ambient compensated bimetallic, melting alloy, or solid state with manual or automatic reset and (2) NO/NC Auxiliary Contacts
 - 3. Provide accessories below as indicated on drawings:
 - a. Control power transformer with primary and secondary fuses.
 - b. Heavy duty, oil-tight, flange-mounted pushbuttons, indicating lights (LED type), and rotary style selector switches.
 - c. Relays and miscellaneous control devices.
 - 4. Provide NEMA 1 enclosure as standard. Provide alternate enclosure types in lieu of NEMA 1 where indicated on drawings. Alternate types include: NEMA 3R, 4, 4X (plastic), 4X (stainless steel), 12, 7 & 9.

2.2 FULL-VOLTAGE REVERSING CONTROLLERS

- A. Manufacturers:
 - 1. Square D Model – Class 8738 Type S or D-Line - LE2 (IEC)
 - 2. Cutler-Hammer Model – ECN 17(NEMA) or ECE 17 (IEC)
 - 3. GE Electrical Model – CR 311 (NEMA) or CL/CK (IEC)
 - 4. Allen Bradley Model – Bulletin 506 (NEMA) or Bulletin 106 (IEC)

- B. Ratings
 - 1. Equipment shall have a short-circuit current rating of 100,000A minimum.
 - 2. Equipment shall be tested and have documentation verifying compliance with Type 2 protection requirements per UL508E or IEC 60947-4.

- C. Construction
 - 1. Provide fused disconnect switch with lockable operating handle and positive visual indication of on/off positions. Fused disconnect switch shall be equipped with clips for Cooper Bussmann LP-CC, LPN-RK/LPS-RK, or LPJ fuses.
 - 2. Provide magnetic motor controller with overload relay, sized as indicated on drawings. Overload relay shall be ambient compensated bimetallic, melting alloy, or solid state with manual or automatic reset and (2) NO/NC Auxiliary Contacts
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 - 4. Provide NEMA 1 enclosure as standard. Provide alternate enclosure types in lieu of NEMA 1 where indicated on drawings. Alternate types include: NEMA 3R, 4, 4X (plastic), 4X (stainless steel), 12, 7 & 9.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Equipment shall be handled and installed in accordance with manufacturer's recommendations.
- B. Equipment shall have a nameplate installed and mounted to the front cover and indicate: motor controller type, ampere rating, voltage rating, short-circuit rating, and load served.
- C. Install overload heater elements and fuses sized to motor characteristics. Install fuses in accordance with Section 2.1 and 2.2. Refer to Section 16491 for product requirements.
- D. Install labeling that identifies replacement overload heater element and fuse type/class and rating.

3.2 START-UP

- A. Inspect and test combination motor starters to assure proper operation. Document findings.

END OF SECTION