

SECTION 16225

MOTORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes single and three phase motors for application on equipment furnished under other sections (and for motors furnished loose to the Project)
- B. Related Sections:
  - 1. Section 16050 – Basic Electrical Materials and Methods
  - 2. Section 16421 – Motor Controllers

1.2 REFERENCES

- A. ABMA 9 (American Boiler Manufacturers Association) – Load Ratings and Fatigue Life for Ball Bearings.
- B. NEMA MG 1 (National Electrical Manufacturers Association) – Motors and Generators
- C. NETA ATS (International Electrical Testing Association) – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS:

- A. Product Data: Submit catalog data for each motor furnished loose. Indicate nameplate data, standard compliance, electrical ratings and characteristics, and physical dimensions, weights, mechanical performance data, and support points.
- B. Test Reports: Indicate procedures and results for specified factory and field-testing and inspections.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Testing Agency: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components
- B. Protect products from weather and moisture by covering with heavy plastic or canvas and by maintaining heating within enclosure.
- C. For extended outdoor storage, remove motors from equipment and store separately.

## PART 2 - PRODUCTS

### 2.1 THREE-PHASE MOTORS

- A. Motors  $\frac{3}{4}$  hp and Larger: Three-phase motor as specified below
  - 1. Motors Smaller than  $\frac{3}{4}$  hp: Single phase motor as specified, except motors less than 250 watts or  $\frac{1}{4}$  hp may be equipment manufacturer's standard
  - 2. Motor: all cast iron construction
  - 3. Insulation: "Inverter Grade" insulation system with "Pulse Resistant" magnet wire. Complies with the new NEMA MG-1 Part 31 specification for inverter duty, bake for added protection of a coil-to-coil short, additional phase paper to protect from a phase-to-phase arc. Insulation System Class F insulation materials with less than 80° C temperature rise at rated load providing longer motor life. Include provisions to prevent bearing pitting when inverter drives are applied.
  - 4. Adjustable frequency 5:1 constant torque or 10:1 variable torque.

### 2.2 SINGLE-PHASE MOTORS

- 1. Permanent split-capacitor type where available, otherwise use split-phase start/capacitor run or capacitor start/capacitor run motor.
- 2. Voltage: 115/230 volts, single phase, 60Hz.

### 2.3 WIRING TERMINATIONS:

- A. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Provide connection schemes in termination cover or motor.

## 2.4 SOURCE QUALITY CONTROL

- A. Test motors in accordance with NEMA MG 1, including winding resistance, no-load speed and current, locked rotor current, insulation high-potential test, and mechanical alignment tests.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Install securely on firm foundation. Mount ball bearing motors with shaft in any position. Provide thrust type bearing as required.
- B. Provide engraved plastic nameplates under the provisions of Section 16050.
- C. Ground and bond motors under the provisions of Section 16050.

### 3.2 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Section 16950 – Testing and Commissioning

END OF SECTION