

## **PART 1 – GENERAL**

This Section includes basic requirements for factory-installed and field-installed motors.

### **1.01 DESIGN CRITERIA**

#### **A. Drawings and Specifications:**

1. Provide unit dimensions, weight loading, required clearances, electrical characteristics and connection requirements.
2. Equipment schedules: Horsepower, RPM, efficiency, electrical requirements, weights, etc.
3. Indicate service access requirements on plans.

#### **B. Design:**

1. Premium Energy Efficient Design, UL Labeled, 1800 RPM.
  - a. Minimum motor efficiency as required by Washington State Energy Code.
  - b. Test according to IEEE 112, Test Method B.
  - c. Use adjustable motor mounting bases for belt-driven motors.
2. Specify ‘off-the-shelf’ motors that are readily available from local distributors.
3. Specify motors with suitable bearings for the intended application (e.g., thrust bearings for vertical shaft motors).
4. Motors heavier than 70 pounds shall be provided with lifting lugs.

#### **C. Motors used with Variable-Frequency Drives:**

1. Ultra-high efficiency totally enclosed, rigid base, NEMA Design B, cast iron construction.
2. Ratings, characteristics, and features coordinated with and approved by drive manufacturer.
3. Motors shall be compatible with and labeled for use on variable frequency drives with 1600 peak volt insulation. Motors shall have a grounding system to protect bearings from capacities discharge through the bearings, with motor and driven equipment bonded to ground.
4. The system shall use shaft grounding rings designed to reduce shaft voltage levels to less than 3 volts.

5. Avoid operating motors in excess of 60-hertz.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

General Electric, Reliance, U.S. Motors, Lincoln, or Goulds.

### **2.02 POLYPHASE MOTORS**

A. Description: Select motor per NEMA MG 1.

1. Stator: Copper windings. Multispeed motors have separate winding for each speed.
2. Rotor: Squirrel cage.
3. Bearings: Double-shielded, pre-lubricated ball bearings suitable for radial and thrust loading.
4. Temperature Rise: Match insulation rating.
5. Insulation: Class F or H.

### **2.03 SINGLE-PHASE MOTORS**

A. Type: As indicated or selected by manufacturer from one of the following, to suit starting torque and other requirements of specific motor application.

1. Permanent-split capacitor.
2. Split-phase start, capacitor run.
3. Capacitor start, capacitor run.

B. Shaded-Pole Motors: Do not use unless motors are smaller than 1/20 hp.

1. Thermal Protection: Internal protection automatically opens power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal protection device automatically resets when motor temperature returns to normal range.

C. Bearings: Ball-bearing type for belt-connected motors and other motors with high radial forces on motor shaft. Sealed, pre-lubricated sleeve bearings for other single-phase motors.

END OF SECTION