SECTION 26 05 90 – MOTORS

PART 1 - GENERAL

1.1. SUMMARY:

A. This section includes design and performance requirements for motors typically used for building mechanical and plumbing systems.

B. Related Sections:
1. Section 01701 - Building Systems Identification and Labeling
2. Section 01 13 01 – Design Guidelines for Energy and Environment
3. Section 01 13 51 – NGRID Electric Rebate Program
4. Section 23 00 10 – HVAC Design Criteria

1.2. QUALITY ASSURANCE:

A. Motors shall be designed, manufactured and tested in accordance with the latest applicable ANSI, NEMA and UL standards and shall be suitable for the intended use on the Project.

1.3. GENERAL REQUIREMENTS:

A. Motors 3/4 hp and larger: Three-phase required.

B. Motors smaller than 3/4 hp: Single-phase permitted.

C. Motors 25 HP and above shall have reduced voltage starter or VFD.

D. Motors shall comply with ASHRAE 90.1 and the requirements of the Energy Policy Act of 1992 where applicable.

E. Motors shall be premium-efficiency type, rated to earn the highest rebate available under utility company rebate program.

F. Where a multi-speed motor is required, strong consideration should be given to utilizing a single speed motor with a variable frequency drive.

G. Motors connected to variable frequency drives (VFDs) shall be inverter duty rated, premium-efficiency type, and compatible with the VFD. Additionally, motors shall incorporate a design to prevent arcing through the motor bearings, such as: insulated bearings or grounded motor shafts.

H. Motors shall be rated for the environment in which they are installed.

I. Avoid the use of open-frame motors in conditioned-air streams, such as within air handlers or return-air and make-up air plenums.

1.4. DETAILED REQUIREMENTS:

A. Three-Phase Motors: NEMA MG 1, Design B, energy-efficient squirrel-cage induction motor:
1. Service Factor: 1.15 or higher as required for service.
2. Enclosure: Meet conditions of installation.

3. Design for continuous operation in 40 degrees C environment, with temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
4. Insulation System: NEMA Class F minimum or, in applications with VFD, suitable for operating at 12 hz.
5. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron.
6. Bearings:
   a. Anti-friction ball bearings rated for minimum ABMA 9, L-10 life of 200,000 hours.
   b. Provide grease lubricated bearings with housings equipped with plugged provision for relubrication, where available in motor size, to be compatible with Brown University preventive maintenance standard grease.
7. Sound Power Levels: Conform to NEMA MG 1.

B. Single Phase Motors:
1. Permanent split-capacitor types where available, otherwise use split-phase start/capacitor run or capacitor start/capacitor run motor.
2. Voltage: As applicable, volts, single phase, 60 Hz.

PART 2 – PRODUCTS:

Not Used

PART 3 - EXECUTION:

3.1 INSTALLATION:

A. Install motors securely on firm foundation.

B. Ground and bond motors as specified elsewhere in Electrical specifications.

C. Motors shall be labeled and tagged with their function, and source panel and circuit number.

END OF SECTION