

## **DIVISION 16 - ELECTRICAL**

### **Section 16170 -Motor Starters**

#### **Introduction**

All motors shall be protected by motor starters (except for fire pump systems or where motor has internal motor protection).

Where available use 480 volt 3 phase power for all motors rated above 1/2 hp. These motors should be protected by three phase motor starters with overloads on all three phases. Where 480 volts is not available utilize 3 phase power at 208 volts.

All motors 1/2 hp and smaller shall be 120 volt.

All motors 1 hp and larger shall utilize magnetic type of motor starters. All motors controlled through the use of control systems shall utilize magnetic type motor starters.

Where five or more starters are required in the same area utilize a motor control center arrangement.

Where both a starter and a disconnecting means are required at the same location use a combination starter. When using automatic controls associated with the motor use a magnetic type starter. When no automatic type of control is needed use a manual motor starter.

Motor starters shall be supplied and installed by the electrical contractor. It shall be required for the Electrical design engineer to coordinate all of the sizes of the motors and indicate the sizes of the motors on the drawings. Where motor sizes shall change due to design changes by the mechanical contractor he shall coordinate the same with the electrical contractor at no additional cost to the University of Arizona.

#### **Part 1 - General**

- Acceptable manufacturers shall be Allen Bradley, General Electric, Cutler Hammer, Square D or prior approved equal.

#### **Part 2 - Products**

- All motor starters shall be NEMA size starters. No IEC type starters shall be utilized.
- Manual motor starters shall be heavy duty, rated minimum of NEMA size 0, and shall have separate replaceable thermal type overload relays.
- Magnetic motor starters shall be heavy duty, rated minimum of NEMA size 0, and shall have separate replaceable thermal type overload relays, one per phase.
- Combination type motor starters shall utilize type FRN rejection Full size fuses rated minimum of 600 volts. With magnetic motor starter as per above, separate 120 volt control transformer, hand- off-auto switch, red and green pilot lights, and minimum of two sets of auxiliary contacts. If an external control source is used then an auxiliary disconnect device is to be added to the starter to disconnect this when disconnecting power for the starter.
- Enclosures shall be NEMA 1 for indoors, NEMA 3R gasketed or the equivalent for outdoor, and NEMA 4X SS where subject to corrosion. The basis for outdoor design/construction is Cutler Hammer NEMA 3R/12.

#### **Part 3 - Execution**

- Motor starters shall be installed at an accessible location. All motor starters shall be identified in accordance with Section 16195.

- Clearances as specified in NEC 110.26 shall be provided.
- Maximum height shall be +72" aff.

**End of Section 16170**