

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope of work under this Section includes all requirements for motor controllers (starters); except motor control centers; to be provided and/or installed under this contract. Motor controls shall conform to NEMA standards for each specific purpose and be U.L. listed.
- B. The Contractor performing the Division 26 work shall furnish motor controllers for all motors shown unless the controllers are included with the equipment furnished under other divisions of these specifications. The contractor performing the Division 26 work shall install all motor controllers including all controllers not factory assembled into equipment furnished under other divisions of these specifications or by Owner. All motors and motor controllers shall be complete and fully operational upon completion of the project.

1.2 MOTOR VOLTAGE INFORMATION

- A. Voltages available are 208 and 480 volt three phase; or 120, 208 and 277 volt single phase. Circuits are designed (in general) for motors with voltage ratings as follows:
 - 1. Smaller than 1/2 HP - 115 volts, single phase.
 - 2. 1/2 HP and larger - 200 or 460 volts, three phase.
- B. Obtain submittals and shop drawings and verify motor sizes and voltages provided under other Divisions prior to commencing work.

PART 2 - PRODUCTS

2.1 MOTOR STARTERS

- A. Magnetic motor starters: Shall conform to or contain items called for below and unless noted otherwise, shall be full voltage non-reversing for NEMA size 3 and under. Starters larger than NEMA size 3 shall be closed transition, autotransformer or wye-delta type. No starters smaller than NEMA size 0 and no half size starters are permitted. Wye-delta type must have motor designed for this use. Contractor is responsible for coordination. Conductors and terminations shall conform with Section 26 05 19-Copper Conductors and Cable.
- B. Overload devices: Shall be melting alloy or bimetallic type. One overload shall be provided for each phase. Provisions shall be made for resetting the overload devices from outside the starter enclosure. Provide ambient compensated overload devices only when the motor is at a constant temperature and the controller is subject to a separate, varying temperature. Automatic reset overload devices are not permitted.
- C. Accessories: Each magnetic motor controller shall include phase loss protector, "HAND-OFF-AUTO" selector switch, 120 volt coil (unless noted otherwise), red running pilot light, green off pilot light, 100VA (minimum) control transformer (except for 115 volt motors), surge suppression kit, with fused primary and secondary, two spare auxiliary interlock contacts and all other accessories required or noted.
- D. Enclosures: All motor controllers shall be contained in an enclosure suitable for the environment in which the controller is mounted. Shall be NEMA 3R when exposed to weather. Other enclosures shall be per code or as noted.

- E. Combination motor controller: Shall be fused switch type (Class RK5), or motor circuit protector type rated for 22,000 RMS A.I.C. minimum unless noted otherwise and containing all accessories as listed above. If externally powered control circuits are used, provide an auxiliary switch on the disconnect switch or protector and fuse in lieu of the control transformer. Switch or protector shall be capable of being padlocked in the off position.
- F. Manual Starters: Shall be toggle switch type, lockable in the "off" position, with overload relays, pilot light and enclosure per above.

2.2 MANUFACTURER

- A. Allen Bradley, Eaton Corporation - Cutler Hammer, General Electric, Siemens, Square D.

2.3 NAMEPLATES

- A. Provide engraved phenolic nameplates per Section 26 05 53 - Identification For Electrical Systems. Permanently attach (with mechanical fasteners) on each controller, nameplates with the following information: load and area served, voltage, phase and (when applicable) fuse size and type.

2.4 FAN SHUTDOWN RELAYS

- A. Contractor shall provide relay(s) with sufficient contacts to shutdown all fans over 2000 cfm upon receipt of fire alarm. See Section 28 31 00 - Fire Detection and Alarm. Coordinate relay coil voltage with fire alarm system supplier.

PART 3 - EXECUTION

3.1 WIRING

- A. Wiring shall conform to applicable sections of these specifications. Provide wiring from branch circuit overcurrent device to motor controller to motor terminals, including installation of starter and all connections. Motor controllers provided under Division 26 shall be combination type. Where starters furnished under other Divisions of the specification or by Owner do not include an integral disconnect switch, a separately mounted disconnect switch shall be provided. Provide raceway and conductors as shown for remote control, or interlock connections. Coordinate other control wiring with Division 25 of the Specifications. Provide overload elements in controllers sized to match motor nameplate full load amperes. Space within controllers shall not be used as a junction box.

3.2 SUPPORTS

- A. Securely mount to equipment, wall or acceptable mounting frame suitable to withstand earthquake forces. Controllers supported only by raceways are not acceptable.

3.3 FAN SHUTDOWN WIRING

- A. Provide 1/2" raceway with 2 #14 AWG conductors from each fan motor controller to the fire alarm shutdown relay(s). Provide wiring of interlock connections for all (over 2000 CFM) fan starter control circuits via Division 26 furnished fan shutdown relay to shutdown fans upon receipt of fire alarm.

END OF SECTION