

MOTOR CONTROLLERS

GENERAL INFORMATION

This section applies to motor controllers.

DESIGN REQUIREMENTS

- 2.1 Approved Manufacturers:
 - a. Allen-Bradley Co.
 - b. Siemens.
 - c. Cutler-Hammer Products
 - d. General Electric
 - e. Square "D" Co.
- 2.2 Each enclosure shall be furnished with a schematic wiring diagram pasted on the inside of the door.
- 2.3 Specify concrete bases for freestanding motor controllers.
- 2.4 Bundle, train, tie-wrap and support wiring within enclosures.
- 2.5 Coordination: Coordinate the features, accessories, and functions of each motor controller with ratings and characteristics of supply circuit, motor type and size, required control sequence, and duty cycle of motor. Coordinate all controllers with the Trade supplying related systems including the requirements for interlocking with building automation systems.
- 2.6 Starters generally shall be full voltage non-reversing NEMA style contactors with integral fused disconnect switch or motor circuit protector, solid state motor overloads, control power transformer and cover-mounted H-O-A switch and RED = Run Pilot Light.
- 2.7 Starters shall be provided with an NEMA 1 enclosure for indoor use and NEMA 3R for outdoor use.
- 2.8 Starters shall be provided with the number of auxiliary contact required to suit the control sequence plus two (2) Form 'C' spare contacts.
- 2.9 Clearly spell out the delineation of work between mechanical and electrical contractor in design documents.
- 2.10 All motor starters shall have external lockable disconnect means.

CONSTRUCTION REQUIREMENTS

- 3.1 Required field tests shall include:
- a. Operate circuit breakers to insure smooth operation.
 - b. Continuity test.
 - c. Insulation-resistance tests on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed and across each open pole.
 - d. Contact/pole-resistance tests.
 - e. Adjustments for final settings.
 - f. Short-time pickups.
 - g. Ground-fault pickup and time delays.
 - h. Instantaneous pickups.
 - i. Contact gap, wipe, alignment, and pressure tests.
 - j. Insulation-resistance tests on each pole, phase-to-phase and phase-to-ground with starter closed and across each open pole.
 - k. Check the horsepower, voltage, phase, speed, service factor, full load amperes and frame size from the motor nameplate and record the values.
- 3.2 Wire nuts are not permitted inside controllers or starters. Control wires that need to be joined inside the enclosure and all field wire will be landed on terminal blocks inside the enclosure with the wires marked appropriately with the circuit they serve.
- 3.3 Motor controllers must be installed in a manner that allows for ease of maintenance and troubleshooting.
- 3.4 All controllers will be supplied with "Push-to-Test" LED indicators and the ability to be remotely monitored via BMS.

END OF SECTION