

- B. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering.

1.8 WARRANTY

- A. For 10 HP and larger motors provide five-year warranty under provisions of Section 01700.
- B. For 7 ½ HP and smaller motors provide minimum one-year or standard manufacturer's warranty, whichever is better.

PART 2 PRODUCTS

2.1 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Motors Less Than 250 Watts, for Intermittent Service: Equipment manufacturer's standard and need not conform to these specifications.
- B. Electrical Service:
 - 1. Refer to Section 16180 for required electrical characteristics.
 - 2. Motors ½ HP and smaller: 115 Volts, single-phase, 60 Hz.
 - 3. Motors ¾ to 2 HP: 208 Volts, single-phase, 60 Hz.
 - 4. Motors 3 HP and larger: 480 Volts, three-phase, 60 Hz.
- C. Type:
 - 1. Open drip-proof except where specifically noted otherwise.
 - 2. Motors: Design for continuous operation in 40°C environment.
 - 3. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
 - 4.

- L. Weatherproof Epoxy Sealed Motors: Epoxy seal windings using vacuum and pressure with rotor and starter surfaces protected with epoxy enamel; bearings double shielded with waterproof non-washing grease.
- M. Nominal Efficiency: As scheduled at full load and rated voltage when tested in accordance with IEEE 112.
- N. Nominal Power Factor: As scheduled at full load and rated voltage when tested in accordance with IEEE 112.

PART 3 EXECUTION

3.1 APPLICATION

- A. Single-phase motors for shaft mounted fans: Split phase type.
- B. Single-phase motors for shaft mounted fans or blowers: Permanent split capacitor type.
- C. Single-phase motors for fans, pumps, blowers, and air compressors: Capacitor start type.
- D. Single-phase motors for fans, blowers, and pumps: Capacitor start, capacitor run type.
- E. Motors located in exterior locations, wet air streams, air cooled condensers, direct drive axial fans, dust collection systems: Totally enclosed type.
- F. Motors located in outdoors: Totally enclosed weatherproof, factory epoxy-treated type.
- G. Motors located in draw thru cooling towers: Totally enclosed weatherproof, factory epoxy-sealed type.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

3.3 NEMA OPEN MOTOR SERVICE FACTORS SCHEDULE

| HP | 3600 RPM | 1800 RPM | 1200 RPM | 900 RPM |
|-------------|----------|----------|----------|---------|
| 1/6 - 1/3 | 1.35 | 1.35 | 1.35 | 1.35 |
| 1/2 | 1.25 | 1.25 | 1.25 | 1.15 |
| 3/4 | 1.25 | 1.25 | 1.15 | 1.15 |
| 1 | 1.25 | 1.15 | 1.15 | 1.15 |
| 1 1/2 - 150 | 1.15 | 1.15 | 1.15 | 1.15 |

3.4 PERFORMANCE SCHEDULE: THREE- PHASE, ENERGY EFFICIENT, OPEN DRIP-PROOF

| HP | RPM (Syn) | NEMA Frame | Minimum Percent Efficiency | Minimum Percent Power Factor |
|-------|--------------|---------------|----------------------------------|------------------------------------|
| 3 | 1200 | 213T | 86 | 60 |
| 5 | 1200 | 215T | 87 | 65 |
| 7 1/2 | 1200 | 254T | 89 | 73 |
| 10 | 1200 | 256T | 89 | 74 |
| 15 | 1200 | 284T | 90 | 77 |
| 20 | 1200 | 286T | 90 | 78 |
| 25 | 1200 | 324T | 91 | 74 |
| 30 | 1200 | 326T | 91 | 78 |

Florida Tech

Design and Construction Standards

| | | | | |
|-----|------|------|----|----|
| 40 | 1200 | 364T | 93 | 77 |
| 50 | 1200 | 365T | 93 | 79 |
| 60 | 1200 | 404T | 93 | 82 |
| 75 | 1200 | 405T | 93 | 80 |
| 100 | 1200 | 444T | 93 | 80 |
| 125 | 1200 | 444T | 93 | 84 |
| 3 | 1800 | 182T | 86 | 86 |
| 5 | 1800 | 184T | 87 | 87 |
| 7½ | 1800 | 213T | 88 | 86 |
| 10 | 1800 | 215T | 89 | 85 |
| 15 | 1800 | 256T | 91 | 85 |
| 20 | 1800 | 256T | 91 | 86 |
| 25 | 1800 | 284T | 91 | 85 |
| 30 | 1800 | 286T | 92 | 88 |
| 40 | 1800 | 324T | 92 | 83 |
| 50 | 1800 | 326T | 93 | 85 |
| 60 | 1800 | 364T | 93 | 88 |
| 75 | 1800 | 365T | 93 | 88 |
| 100 | 1800 | 404T | 93 | 83 |
| 125 | 1800 | 405T | 93 | 86 |
| 150 | 1800 | 444T | 93 | 85 |
| 200 | 1800 | 445T | 94 | 85 |
| 3 | 3600 | 145T | 84 | 85 |
| 5 | 3600 | 182T | 85 | 86 |
| 7½ | 3600 | 184T | 86 | 88 |
| 10 | 3600 | 213T | 87 | 86 |
| 15 | 3600 | 215T | 89 | 89 |
| 20 | 3600 | 254T | 90 | 89 |
| 25 | 3600 | 256T | 90 | 92 |
| 30 | 3600 | 284T | 91 | 91 |
| 40 | 3600 | 286T | 92 | 92 |
| 50 | 3600 | 324T | 93 | 89 |
| 60 | 3600 | 326T | 93 | 91 |
| 75 | 3600 | 324T | 93 | 88 |
| 100 | 3600 | 365T | 92 | 88 |

3.5

Florida Tech

Design and Construction Standards

| | | | | |
|-----|------|------|----|----|
| 30 | 1200 | 326T | 91 | 79 |
| 40 | 1200 | 364T | 92 | 78 |
| 50 | 1200 | 365T | 92 | 81 |
| 60 | 1200 | 404T | 92 | 83 |
| 75 | 1200 | 405T | 92 | 80 |
| 100 | 1200 | 444T | 93 | 83 |
| 125 | 1200 | 445T | 93 | 85 |
| 3 | 1800 | 182T | 87 | 83 |
| 5 | 1800 | 184T | 88 | 83 |
| 7½ | 1800 | 213T | 89 | 85 |
| 10 | 1800 | 215T | 90 | 84 |
| 15 | 1800 | 254T | 91 | 86 |
| 20 | 1800 | 256T | 91 | 85 |
| 25 | 1800 | 284T | 92 | 84 |
| 30 | 1800 | 286T | 93 | 86 |
| 40 | 1800 | 324T | 93 | 83 |
| 50 | 1800 | 326T | 93 | 85 |
| 60 | 1800 | 364T | 93 | 87 |
| 75 | 1800 | 365T | 93 | 87 |
| 100 | 1800 | 405T | 94 | 86 |
| 125 | 1800 | 444T | 94 | 87 |
| 150 | 1800 | 445T | 94 | 88 |
| 200 | 1800 | 447T | 95 | 87 |
| 3 | 3600 | 182T | 82 | 87 |
| 5 | 3600 | 184T | 85 | 88 |
| 7½ | 3600 | 213T | 86 | 86 |
| 10 | 3600 | 215T | 86 | 86 |
| 15 | 3600 | 254T | 88 | 91 |
| 20 | 3600 | 256T | 89 | 89 |
| 25 | 3600 | 284T | 90 | 92 |
| 30 | 3600 | 286T | 91 | 92 |
| 40 | 3600 | 324T | 91 | 91 |
| 50 | 3600 | 326T | 90 | 92 |
| 60 | 3600 | 326T | 91 | 93 |
| 75 | 3600 | 364T | 91 | 91 |
| 100 | 3600 | 365T | 92 | 92 |

END OF SECTION