

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

- .1 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
 - .1 ASHRAE 90.1-2010, Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA cosponsored; ANSI approved; Continuous Maintenance Standard).
- .2 Electrical Equipment Manufacturers' Association Council (EEMAC)
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.
- .3 Quality Control: in accordance with Section 01 45 00 – Testing and Quality Control.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
- .4 Closeout Submittals
 - .1 Provide maintenance data for motors, drives and guards for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements: work to be performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial /Territorial regulations.
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- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 Motors: high efficiency, in accordance with local electrical power company standards and to ASHRAE 90.1.

2.2 MOTORS

- .1 Motors to be built in accordance with the latest NEMA and IEEE standards, and in accordance with ASHRAE Standard 90.1.
 - .2 Furnish motor sizes, electrical power and starting characteristics as shown in performance specifications and in schedules on drawings.
 - .1 Motors to be rated for continuous full load duty at 40°C ambient temperature and 1.15 service factor.
 - .2 Motors to be NEMA design ball bearing type.
 - .1 Direct drive fans to be coupled with motors that closely match required fan rpm.
 - .3 Provide inverter-duty motors for all variable speed applications.
 - .3 Motors under 373 W (1/2 HP): speed as indicated, continuous duty, built-in overload protection, resilient mount, single phase, 115 V, unless otherwise specified or indicated.
 - .4 Motors 373 W (1/2 HP) and larger: EEMAC Class B, squirrel cage induction, speed as indicated, continuous duty, drip proof, ball bearing, maximum temperature rise 40 degrees C, 3 phase, 575 V, unless otherwise indicated.
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2.3 CONTROL PANEL

- .1 Provide control panels for all motors on all packaged equipment.
- .2 Motor starters shall be factory mounted and wired to motor.
- .3 Control panels to include:
 - .1 Main power disconnect.
 - .2 Motor contractor(s).
 - .3 Individual short circuit and overload protection.
 - .4 120V control power transformer with primary and secondary protection.
 - .5 Terminal strip for field connections.
 - .6 hand-Off-Auto switch(es).

2.4 TEMPORARY MOTORS

- .1 If delivery of specified motor will delay completion or commissioning work, install motor approved by Departmental Representative for temporary use. Work will only be accepted when specified motor is installed.

2.5 BELT DRIVES

- .1 Fit reinforced belts in sheave matched to drive. Multiple belts to be matched sets.
 - .2 Use cast iron or steel sheaves secured to shafts with removable keys unless otherwise indicated.
 - .3 For motors under 7.5 kW (10 HP): standard adjustable pitch drive sheaves, having plus or minus 10% range. Use mid-position of range for specified r/min.
 - .4 For motors 7.5 kW (10 HP) and over: sheave with split tapered bushing and keyway having fixed pitch unless specifically required for item concerned. Provide sheave of correct size to suit balancing.
 - .5 Correct size of sheave determined during testing and to be supplied by Mechanical Contractor.
 - .6 Minimum drive rating: 1.5 times nameplate rating on motor. Keep overhung loads within manufacturer's design requirements on prime mover shafts.
 - .7 Motor slide rail adjustment plates to allow for centre line adjustment.
 - .8 Supply one set of spare belts for each set installed in accordance with Section 01 78 00 - Closeout Submittals.
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2.6 DRIVE GUARDS

- .1 Provide guards for unprotected drives.
- .2 Guards for belt drives;
 - .1 Expanded metal screen welded to steel frame.
 - .2 Minimum 1.2 mm thick sheet metal tops and bottoms.
 - .3 38 mm dia holes on both shaft centres for insertion of tachometer.
 - .4 Removable for servicing.
- .3 Provide means to permit lubrication and use of test instruments with guards in place.
- .4 Install belt guards to allow movement of motors for adjusting belt tension.
- .5 Guard for flexible coupling:
 - .1 "U" shaped, minimum 1.6 mm thick galvanized mild steel.
 - .2 Securely fasten in place.
 - .3 Removable for servicing.
- .6 Unprotected fan inlets or outlets:
 - .1 Wire or expanded metal screen, galvanized, 19 mm mesh.
 - .2 Net free area of guard: not less than 80% of fan openings.
 - .3 Securely fasten in place.
 - .4 Removable for servicing.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Fasten securely in place.
 - .2 Make removable for servicing, easily returned into, and positively in position.
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3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.