

**PART 1      GENERAL**

**1.1      REFERENCES**

- .1 American Bearing Manufacturer's Association (ABMA)
  - .1 ANSI/ABMA 9 Load Ratings and Fatigue Life for Ball Bearings.
  - .2 ANSI/ABMA 11 Load Ratings and Fatigue Life for Roller Bearings.
- .2 Air Movement and Control Association (AMCA)
  - .1 AMCA 210, Laboratory Method of Testing Fans for Aerodynamic Performance Rating (ASHRAE).
  - .2 AMCA 300 Reverberant Room Method for Sound Testing of Fans.
- .3 American National Standards Institute/Air-Conditioning, Heating and Refrigeration Institute (ANSI/AHRI)
  - .1 ANSI/AHRI 430, Central Station Air Handling Units.
  - .2 ANSI/AHRI 1060, Performance Rating of Air-to-Air Heat Exchangers Energy Recovery Ventilation Equipment.
- .4 American Society of Heating Refrigeration and Air-Conditioning Engineers (ASHRAE)
  - .1 ASHRAE 68, Laboratory Method of Testing to Determine the Sound Power in a Duct.
  - .2 ASHRAE 84, Method of Testing Air-to-Air Exchangers.
- .5 American Society for Testing and Materials (ASTM)
  - .1 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .6 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .7 Canadian Standards Association (CSA)
  - .1 CSA B52 Mechanical Refrigeration Code.
- .8 National Electrical Manufacturer's Association (NEMA)
  - .1 NEMA MG1 Motors and Generators
  - .2 NEMA ICS 7-1 Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems.
- .9 Provincial Boiler, Pressure Vessel and Compressed Gas Regulations.
- .10 Sheet Metal and Air-Conditioning Contractors' National Association (SMACNA).

**1.2**            **SHOP DRAWINGS AND PRODUCT DATA**

- .1        Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Indicate following: fan, fan curves showing point of operation, motor drive, bearings, filters, mixing box, dampers, VAV, coil, include performance data.

**1.3**            **CLOSEOUT SUBMITTALS**

- .1        Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2        Include following: fan, bearings, motor, damper, VAV control, air volume, total cooling, sensible cooling, EDB, EWB, OAT.

**1.4**            **WASTE MANAGEMENT AND DISPOSAL**

- .1        Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 02 41 13 Selective Site Demolition

**1.5**            **EXTRA MATERIALS**

- .1        Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2        Provide one spare set of filters.
- .3        Provide list of individual manufacturer's recommended spare parts for equipment such as bearings and seals, and addresses of suppliers, together with list of specialized tools necessary for adjusting, repairing or replacing, for placement into operating manual.
- .4        Spare filters: in addition to filters installed for startup and commissioning. Immediately prior to acceptance by Departmental Representative, supply 1 complete set of filters for each filter unit or filter bank.

**1.6**            **TRAINING**

- .1        Provide training in accordance with Section 01 91 41 – Commissioning (Cx) Training.

**PART 2**        **PRODUCTS**

**2.1**            **GENERAL**

- .1        Energy recovery equipment complying with ASHRAE 84.

- .2 Performance:
  - ERV-1
    - .1 Capacity: 182 L/s, 100Pa static pressure
    - .2 Sensible Effectiveness: 61%.
  - ERV-2
    - .1 Capacity: 120 L/s, 100Pa static pressure
    - .2 Sensible Effectiveness: 61%.
  - ERV-3
    - .1 Capacity: 33 L/s, 100Pa static pressure
    - .2 Sensible Effectiveness: 56%.
    - .3 Wall control with fan and dehumidistat switches

## **2.2 AIR TO AIR FIXED PLATE ENERGY RECOVERY VENTILATOR (ERV)**

- .1 Casing: 20 Ga thick galvanized steel with lapped corners and zinc plated screw fasteners and water tight standing seam joints. Insulated cleanable interior.
- .2 Heat transfer surfaces: both heat and humidity shall be transferred using static plate core technology.
- .3 Cross contamination: not permitted.
- .4 Condensate drain: shall be provided.
- .5 Removable access panels.
- .6 Blower motors shall be premium efficiency with factory installed motor starters. The unit shall be single point power and control power connections.
- .7 The ERV core shall be protected by MERV 8 rated 2" nominal pleated, disposable filter in both supply and return air streams.
- .8 Performance characteristics: as indicated.

## **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 datasheets.

**3.2**            **INSTALLATION**

- .1        Install in accordance with manufacturers recommendations.
- .2        Support independently of ductwork.
- .3        Locate so that controls, dampers and access panels are easily accessible.

**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.

**3.4**            **COMMISSIONING**

- .1        Commission in accordance with section 01 91 13 – General Commissioning (Cx) requirements.

**END OF SECTION**