

SECTION 23 72 23
PACKAGED AIR-TO-AIR ENERGY RECOVERY UNITS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Packaged dessicant air-to-air energy recovery units.
- B. Duct-Mounted Pre-Heat Coils

1.02 RELATED SECTIONS

- A. Section 01 91 00 - Commissioning
- B. Section 01 91 10 - Functional Testing Procedures
- C. Section 23 08 00 - Mechanical Systems Commissioning
- D. Section 23 08 10 - Control Systems Commissioning
- E.

1.03 REFERENCE STANDARDS

- A. AHRI 1060 I-P - Performance Rating of Air-to-Air Exchangers for Energy Recovery Ventilation Equipment.
- B. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- C. ASHRAE Std 84 - Method of Testing Air to Air Heat/Energy Exchangers.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. NFPA 70 - National Electrical Code.
- F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.
- G. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's installation instruction, product data, and engineering calculations.
- C. Shop Drawings: Show design and assembly of energy recovery unit and installation and connection details.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Firm regularly engaged in manufacturing energy recovery units.
 - 2. Products in satisfactory use in similar service for not less than five years.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store in manufacturer's unopened packaging.
- B. Store products to be installed indoors in dry, heated area.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty motor to be free from defects in material and workmanship for 7 years under circumstances of normal use.

- C. Warranty dessicant core to be free from defects in material and workmanship for 10 years under circumstances of normal use.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Energy Recovery Ventilators:
 - 1. Renew Aire: www.renewaire.com.
 - 2. Nu-Air: www.nu-air.com
 - 3. Innovent: www.innoventair.com
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ENERGY RECOVERY UNITS

- A. Energy Recovery Units: Fixed plate cross-flow energy exchange type (hydroscopic resin) type; prefabricated packaged system designed by manufacturer.
 - 1. Access: Hinged access panels on front. Pressure taps provided.
 - 2. Lifting holes at the unit base.
 - 3. Framing: Welded extruded aluminum tubular frame capable of supporting components and casings.
 - 4. Permanent name plate listing manufacturer mounted inside door near electrical panel.

2.03 CASING

- A. Wall, Floor, and Roof Panels:
 - 1. Construction: 2 inch thick, double wall box construction, with formed edges of exterior wall overlapping formed edges of interior wall.
 - 2. Exterior Wall: galvanized steel sheet. or aluminum.
 - a. 20 gage galvanized steel,
 - b. Color: Gray or white
 - 3. Interior Wall: Galvanized sheet metal.
 - a. 22 gage, 0.0299 inch galvanized sheet metal.
 - 4. Insulation:
 - a. 2 inch insulated fiberglass board insulation.
 - b. All insulation sealed with foil/scrim facing leaving no exposed insulation to the airstream.
 - c. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84, NFPA 255, and UL 723.
 - d. Smoke Developed Index: 50, maximum, when tested in accordance with ASTM E84, NFPA 255, and UL 723.
 - 5. Roof Panel: Weatherproof.
 - 6. Panel Joints: 20 gauge steel with lapped corners and zinc-plated screws.
 - 7. Fasteners: Stainless steel.
 - 8. Isolation and Seal: Form continuous, thermally isolated, weather tight seal between inner wall of panels and structural framing with closed cell PVC foam gasketing.
 - 9. Seams: Sealed, requiring no caulking at job site.
 - 10. Coating: Polyurethane enamel. Factory finished in a custom color as selected by the architect.
- B. Access Panels: Provide access to components through a large, tightly sealed and easily removable panel.
- C. Doors:
 - 1. Construct doors of same construction and thickness as wall panels.
 - 2. Hardware:
 - a. Corrosion-resistant.

2.04 FANS

- A. Provide separate fans for exhaust and supply blowers.
- B. Fans:
 - 1. Individually driven with a dedicated motor.
 - 2. AMCA-rated.
 - 3. Provide with non-overloading characteristics.
 - 4. Provide non-sparking integral spun steel venturie inlet cones.
- C. Bearings:
 - 1. Pillow block.
 - 2. Bearings: Permanently lubricated sealed ball bearings.
 - 3. Rated for not less than 200,000 hours of operation with accessible greased fittings.
- D. Housings: 12 gage, 0.1046 inch aluminized steel with plenums integral to general housing and constructed to Class 1 fan standards.
- E. Motors:
 - 1. Motors: ECM direct drive or VFD-driven as scheduled.
 - 2. Efficiency: Premium.
 - 3. Speed: Variable.
 - 4. Control: Variable Frequency Drive.
 - 5. Motor Slide Bases: Removable and adjustable.
 - 6. Fan Motor: Thermal overload protected.
 - 7. Fan Motor: UL listed and labeled.
- F. Drives:
 - 1. Fans: Belt driven or direct as scheduled.
 - 2. Sheaves: Variable.
 - 3. Service Factor: 1.2.
- G. Belt Guards: Full sized, hinged, painted with high-visibility safety color, and accessible with standard tools.

2.05 TOTAL ENERGY RECOVERY MEDIA

- A. Transfer heat and humidity from one air stream to the other with no carryover of the exhaust air into the supply air stream.
- B. Effectiveness: Rated in accordance with ASHRAE Std 84 and AHRI 1060.
- C. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84, NFPA 255, and UL 723.
- D. Smoke Developed Index: 50, maximum, when tested in accordance with ASTM E84, NFPA 255, and UL 723.
- E. Energy Recovery Media Facing:
 - 1. Conform to NFPA 90A.
- F. Coat all corrugated surfaces with a thin non-migrating absorbent layer.

2.06 FILTERS

- A. Efficiency: 13 MERV.
- B. Fresh Air Stream: MERV 13 filters constructed to meet ASHRAE Std 52.2.
- C. Exhaust Air Stream: MERV 8 filters constructed to meet ASHRAE Std 52.2.
- D. Filter Racks: Bolt-on rack constructed of 0.08 inch, minimum, thick aluminum with hinged side access door and snap fasteners.

- E. Filter Removal Hooks: Provide means to remove filters that are not immediately accessible from exterior of unit
- F. Mount 1/2 inches thick permanent aluminum washable type filter in the outside air hood and in the return plenum air.

2.07 DAMPERS

- A. Motorized Dampers: Provide motorized dampers at outside air inlet, exhaust air outlet, and supply air outlet.
 - 1. Type: Motorized two position low-leak.
 - 2. Blades: Insulated, single blade damper.

2.08 VIBRATION ISOLATION

- A. Vibration Isolation: Provide enclosed spring isolators having minimum 2" static deflection.
- B. Construct with appropriately-sized, seismic-rated, corrosion-resistant captive-spring isolators.

2.09 ROOF CURBS

- A. Curbs: Provide full perimeter vibration-isolating roof curb fabricated from 10 gage aluminized steel.
 - 1. Curbs: Knock-down type.
 - 2. Provide slope for roof deck as required.
- B. Gaskets: Provide closed cell PVC foam.
 - 1. Install between top flange of isolation rail and bottom of energy recovery unit.
 - 2. Install on top of curb.

2.10 POWER AND CONTROLS

- A. Motor Control Panels: UL listed.
- B. Include necessary motor starters, VFDs, fuses, transformers and overload protection according to NFPA 70.
- C. Provide single-point field connection to power supply.
- D. Provide non fused main disconnect integral to control panel.
- E. Install wiring in accordance with NFPA 70.
- F. Wiring: Enclosed in flexible, liquid tight steel conduit.

2.11 ACCESSORIES

- A. Electric Preheat Coil (Duct Mounted):
 - 1. Resistance coil type with elements enclosed in a steel sheath with fins and painted with a baked-on aluminum paint for long life in a 100% fresh air stream.
 - 2. Coil: UL listed and constructed in accordance with NFPA 70 requirements.
 - 3. Controls: Factory-provided SCR controls to maintain defined temperature (see schedule for details).

2.12 SERVICE ACCESSORIES

- A. Internal Service Lights: Provide vapor tight light with protective cage and minimum 40 watt bulb.
- B. Electrical Receptacle:
 - 1. Provide duplex, ground fault interrupter type receptacle.
 - 2. Provide re-settable circuit breaker in control panel.
- C. Switch: 2 type.
 - 1. Two Position Type: Service and Operate.
- D. Electrical Components: Factory wired for single point power connection.
 - 1. 60 Hz power connection.

2. Isolate electrical box from the airflow.
3. Protect all integral wires and connections.
4. Electrical Components: UL Listed.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

- A. Provide openings for suitable ductwork connection.

3.03 SYSTEM STARTUP

- A. Provide services of manufacturer's authorized representative to provide start up of unit.

3.04 CLEANING

- A. Clean filters, air plenums, interior and exposed-to-view surfaces prior to Substantial Completion.

END OF SECTION