

SECTION 237219 - FIXED PLATE AIR-TO-AIR ENERGY RECOVERY UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fixed-plate, sensible and total, heat exchangers. Alternate ERU/ERV's are also acceptable pending HPD approval.
- B. Reference and Industry Standards
Comply with relevant HPD design guidelines section or appendix.
- C. <https://www.nyc.gov/site/hpd/services-and-information/sustainability.page>
- D. <https://www.nyc.gov/site/hpd/services-and-information/blds.page>

1.2 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.3 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of unit components.
- C. ASHRAE Compliance:
 - 1. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
 - 2. Capacity ratings for air-to-air energy recovery equipment shall comply with ASHRAE 84, "Method of Testing Air-to-Air Heat/Energy Exchangers."
- D. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

- E. Comply with [ASTM E84
- F. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to detail fabrication and assembly of air-to-air energy recovery equipment.

2.2 FIXED-PLATE SENSIBLE HEAT EXCHANGERS

- A. Casing: Aluminum or Galvanized steel with duct collars.
- B. Plates: Evenly spaced, sealed, and arranged for counter or cross airflow.
 - 1. Plate Material: Embossed aluminum or Stainless steel.
- C. Bypass Plenum: Within casing, with gasketed face-and-bypass dampers having operating rods extended outside casing.
- D. Maximum Differential Pressure: Suitable for maximum 6-inch wg (1500 Pa).
- E. Maximum Temperature: Suitable for maximum 194 deg F (90 deg C).

2.3 FIXED-PLATE TOTAL HEAT EXCHANGERS

- A. Casing: Aluminum or Galvanized steel.
- B. Drain Pan: Same material as casing, with drain connections on exhaust and supply side Molded ABS covering bottom of case, with drain connections on exhaust and supply side.
 - 1. Comply with requirements in ASHRAE 62.1.
- C. Plates: Evenly spaced, sealed, and arranged for counter airflow.
 - 1. Plate Material and Coating: Chemically treated paper, or polymer on aluminum, with selective hydroscopicity, moisture permeability, and gas barrier properties.
- D. Bypass Plenum: Within casing, with gasketed face-and-bypass dampers having operating rods extended outside casing.
- E. Maximum Differential Pressure: Suitable for maximum 6-inch wg (1500 Pa).
- F. Maximum Temperature: Suitable for maximum [194 deg F (90 deg C)].

2.4 SOURCE QUALITY CONTROL

- A. AHRI 1060 Certification: Certified according to AHRI 1060.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fixed-plate heat exchangers so supply and exhaust airstreams flow in opposite directions.
 - 1. Install duct access doors in both supply and exhaust ducts, both upstream and downstream, for access to heat exchanger. Access doors and panels are specified in Section 233300 "Air Duct Accessories."
- B. Install floor-mounted units on ~~4-inch-~~ (100-mm-) high, concrete base designed to withstand, without damage to equipment, seismic force required by code].
- C. Equipment Mounting:
 - 1. Install air-to-air energy recovery equipment on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
- D. Install seismic restraints according to manufacturers' written instructions.
- E. Install units with clearances for service and maintenance.
- F. Comply with requirements for ductwork specified in Section 233113 "Metal Ducts."
- G. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for air-handling system testing, adjusting, and balancing.

3.2 PIPING CONNECTIONS

- A. Comply with requirements for piping specified in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to unit, allow space for service and maintenance.
- C. Connect piping to units mounted on vibration isolators with flexible connectors.
- D. Condensate Drain Piping: Pipe drains from drain pans to nearest floor drain; use ~~ASTM B88, Type L~~ (ASTM B88M, Type B), drawn-temper copper water tubing with soldered joints, same size as condensate drain connection.
- E. Condensate Drain Piping: Pipe drains from drain pans to nearest floor drain; use ASTM D1785, Schedule 40 PVC pipe and solvent-welded fittings, same size as condensate drain connection.
- F. Condensate Drain Piping Installation: Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

3.3 ELECTRICAL CONNECTIONS

- A. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Install electrical devices furnished by manufacturer, but not factory mounted, according to NFPA 70 and NECA 1.
- D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
 - 1. Nameplate shall be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
 - 2. Nameplate shall be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least **1/2 inch (13 mm)** high.

3.4 CONTROL CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring according to Section 260523 "Control-Voltage Electrical Power Cables."

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper water wash control and unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- D. Air-to-air energy recovery equipment will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

3.6 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that shipping, blocking, and bracing are removed.
3. Verify that unit is secure on mountings and supporting devices and that connections to electrical systems are complete. Verify that proper thermal-overload protection is installed.
4. Verify water wash mechanism operation.

B. Starting procedures for air-handling units include the following:

1. Energize water wash motor and verify proper operation of motor and water wash system.
2. Measure and record motor electrical values for voltage and amperage.

3.7 CLEANING

- A. After completing system installation and testing, adjusting, and balancing air-to-air heat recovery unit, and after completing startup service, clean unit to remove foreign material and construction dirt and dust.

3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fixed-plate air-to-air energy recovery units.

END OF SECTION 237219