

## SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.
  - 1. Indoor units (5 tons or less).
  - 2. Outdoor Units (5 tons or less).
  - 3. Thermostats.
  - 4. Accessories.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Operation and maintenance data.
- D. Warranty: Sample of special warranty.

#### 1.3 QUALITY ASSURANCE

- 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. ASHRAE Compliance:
  - 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
  - 2. Applicable requirements in ASHRAE 62.1-2004, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-Up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:
  - a. For Compressor: Five years from date of Substantial Completion.
  - b. For Parts: One years from date of Substantial Completion.
  - c. For Labor: One years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  1. Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
  2. Goodman Manufacturing Company
  3. Lennox International Inc.
  4. Trane; a business of American Standard companies.
  5. YORK; a Johnson Controls company.

### 2.2 INDOOR UNITS (5 TONS OR LESS)

- A. Horizontal or Vertically Installed Air Handler Components:
  1. Cabinet: Galvanized steel with removable panels for servicing. Cabinet shall be configurable for either horizontal or vertical configurations. Cabinet air leakage shall be less than 2.0% at 1.0 inch H<sub>2</sub>O and less than 1.4% at 0.5 inch H<sub>2</sub>O when tested in accordance with ASHRAE standard 193.
  2. Insulation: Foil-faced, glass-fiber duct liner.
  3. Refrigerant Coil: Copper or aluminum tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
  4. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
  5. Fan: Direct-drive, multi-speed ECM blower motor (provide PSC blower motor only if ECM option is not available) with internal thermal protection and permanent lubrication.
  6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
  7. Filters: Throwaway.
  8. Condensate Drain Pans: Thermoplastic drain pan with primary and secondary drain connections. Install a condensate overflow switch in the secondary drain connection.
  9. Equipment Stand: Provide a welded equipment stand for vertical installations to allow for a bottom duct connection.
  10. Testing: Unit shall be AHRI certified and ETL listed.
  11. Capacity and Characteristics: Refer to schedule on Contract Drawings.
- B. Wall-Mounted Air Handler Components:
  1. Cabinet: Galvanized steel with removable front panel for servicing. Cabinet air leakage shall be less than 2.0% at 1.0 inch H<sub>2</sub>O and less than 1.4% at 0.5 inch H<sub>2</sub>O when tested in accordance with ASHRAE standard 193.

2. Insulation: Foil-faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper or aluminum tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
4. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
5. Fan: Direct-drive, multi-speed ECM blower motor (provide PSC blower motor only if ECM option is not available) with internal thermal protection and permanent lubrication.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
7. Filters: Throwaway.
8. Condensate Drain Pans: Thermoplastic drain pan with primary and secondary drain connections. Install a condensate overflow switch in the secondary drain connection.
9. Wall Access Panel: Provide a removable wall access panel with return air grille.
10. Disconnect: Provide a factory-installed pull-type disconnect.
11. Testing: Unit shall be AHRI certified and ETL listed.
12. Capacity and Characteristics: Refer to schedule on Contract Drawings.

## 2.3 OUTDOOR UNITS (5 TONS OR LESS)

- A. Air-Cooled, Compressor-Condenser Components:
1. Casing: Steel, finished with baked enamel, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
  2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
    - a. Compressor Type: Scroll.
    - b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
    - c. Refrigerant Charge: R-410A.
    - d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 210/240.
  3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
  4. Fan: Aluminum-propeller type, directly connected to motor.
  5. Motor: Permanently lubricated, with integral thermal-overload protection.
  6. Low Ambient Kit: Permits operation down to 45 deg F.

## 2.4 THERMOSTATS

- A. Description: Remotely-mounted, wired, and programmable with the following features:
1. Standard Features:
    - a. Backlit LCD display indicating current temperature, set point temperature, time, and operating mode
    - b. Mode: Auto/Cool/Heat/Off
    - c. Set point adjustment

- d. Scheduling: 5-2-day programmable thermostat to allow time-of-day scheduling for both weekdays and weekends
- e. Time-of-day scheduling: Minimum 5 events per day with set point control
- f. Hold
- g. Auto restart on power failure
- 2. Heat Pump Additional Features:
  - a. Two set point automatic changeover between cooling and heating modes

## 2.5 ACCESSORIES

- A. Automatic-reset timer to prevent rapid cycling of compressor.
- B. Drain Pipe: For condensate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Install ground-mounted, compressor-condenser components on 4-inch-thick, reinforced concrete base that is 4 inches larger, on each side, than unit unless otherwise indicated on the Contract Drawings.
- D. Install and connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

### 3.2 CONNECTIONS

- A. Piping installation requirements are specified in other sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- C. Duct Connections: Drawings indicate the general arrangement of ducts. Connect ducts to split-system air-conditioning units with flexible duct connectors.

### 3.3 FIELD QUALITY CONTROL

- A. Perform Tests and Inspections:
  - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 238126