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.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
C. Detail equipment assemblies and indicate, required clearances, method of field assembly, and location and size of each field connection.
D. Operation and maintenance data.
E. Certification documents for those technicians performing tasks involving refrigerants covered by Section 608 of the Clean Air Act.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70.
B. Standards Compliance:
   1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
   2. Furnish and install equipment and accessories in accordance with the International Mechanical Code.
   3. Furnish and install equipment and accessories in accordance with the International Energy Conservation Code.
   4. Units shall be listed in the applicable ARI Directory of Certified products
   5. Handling of refrigerants and components containing refrigerants shall comply with Section 608 of the Clean Air Act.

1.4 WARRANTY

A. Warranty Period:
   1. For Compressor: Five years from date of Substantial Completion.
   2. For Parts: Two years from date of Substantial Completion.
   3. For Labor: Two years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Trane Company
   2. American Standard
   3. Daikin
   4. York, Johnson Controls Unitary Products
   5. Mitsubishi Electronics America, Inc.; HVAC Division. (Mini-splits only)

2.2 INDOOR UNITS

A. Full-size Evaporator-Fan Components:
   1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
   2. Insulation: Faced, glass-fiber duct liner.
   5. Fan: Direct drive, centrifugal.
   6. Fan Motors:
      a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
      b. Multi-tapped, multispeed with internal thermal protection and permanent lubrication.
   7. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
   8. Condensate Drain Pans:
      a. Fabricated with one percent slope and 2 inches deep in at least two planes to collect condensate and to direct water toward drain connection.
      b. Single-wall, corrosion resistant sheet. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.
      c. General Requirements for Air Filtration Section:
         1) Factory-fabricated, viscous-coated, flat-panel type.
         2) Arrestance according to ASHRAE 52.1: 80.
         3) MERV according to ASHRAE 52.2: 7
         4) Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.

B. Mini-split, Evaporator-Fan Components:
   1. Cabinet: Enameled steel with removable panels on front and ends, and discharge drain pans with drain connection.
2. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
5. Fan Motors: Comply with Section 230513 "Common Motor Requirements for HVAC Equipment." Provide multispeed, permanent lubrication.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
7. Condensate Drain Pans:
   a. Fabricated with one percent slope to direct water toward drain connection.
   b. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.
8. Air Filtration Section:
   1) Factory-fabricated, viscous-coated, flat-panel type.
   2) Arrestance according to ASHRAE 52.1: 80.
   3) MERV according to ASHRAE 52.2: 5
   4) Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.

2.3 OUTDOOR UNITS

A. Air-Cooled, Compressor-Condenser Components:
1. Casing: Steel, finished with baked enamel, with removable panels. 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. Compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
   c. Refrigerant Charge R-407C or R-410A.
   d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 210/240.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits cooling operation down to 0 deg F.
7. Mounting Base: Concrete pad, 4 inches nominal thickness, extend 6 inches beyond all sides of equipment.

2.4 ACCESSORIES

A. Control equipment and sequence of operation are specified in Section 230900 "Instrumentation and Control for HVAC" and Section 230993 "Sequence and Operations for HVAC Controls."
B. Thermostat: Low voltage with subbase to control compressor and evaporator fan.

C. Thermostat: Control compressor and evaporator fan, with the following features:
   1. Compressor time delay.
   2. 24-hour time control of system stop and start.
   3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
   4. Fan-speed selection including auto setting.

D. Automatic-reset timer to prevent rapid cycling of compressor.

E. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

F. Liquid Line Filter Driers:

G. Provide a sealed canister type liquid line filter drier with high water capacity for units with less than ten tons total cooling capacity. Provide a ball valve on each side.

H. Provide a replaceable core type liquid line filter drier with high water capacity for units with ten tons total cooling capacity or greater. Provide a ball valve on each side.

I. Defrost Controls: A time initiated, temperature terminated defrost system shall ship with a setting of 70-minute cycle, with a choice of 50- or 90-minute cycle. Timed override limits defrost cycle to 10 minutes shall be available on units 10 tons and above. Adaptive demand defrost shall be provided on units below 10 Tons.

J. Electrical: Provide single point unit power connection.

K. Unit control box shall be located within the unit and shall contain controls for compressor, reversing valve and fan motor operation and shall have a 50 VA 24-volt control circuit transformer and a terminal block for low voltage field wiring connections.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to or from building structure.

C. Install ground-mounted, compressor-condenser components on 4-inch- thick, reinforced concrete base that is 6 inches larger, on each side, than unit. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete." Coordinate anchor installation with concrete base.
D. Install roof-mounted, compressor-condenser components on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.

E. Install and connect pre-charged refrigerant tubing to component’s quick-connect fittings, locations allowing. If not, fabricate and install tubing in accordance with the units’ manufacturer’s installation instructions and Section 232300 – Refrigerant Piping.

F. The refrigeration system shall be installed and tested in accordance with the International Mechanical Code. Afterwards, the refrigerant system shall pass a standing vacuum test at 500 microns for a minimum of 24 hours.

G. Connection and removal of tubing or gages to a refrigerant charged assembly must be done by a Certified Refrigerant Technician. Adding or removing refrigerant to an assembly must be done by a Certified Refrigerant Technician.

H. Install refrigerant and condensate drainage tubing to allow access to unit.

I. Provide a complete set of new air filters for each unit at Substantial Completion.

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.

3.3 QUALITY CONTROL

A. Complete the manufacturer’s installation and startup checklists and resolve all discrepancies.

B. Provide the Commission Agent, SRP Inspector, and SRP PM with the completed checklists/test results.

3.4 TRAINING

A. Engage a factory-authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain units.

END OF SECTION