

SECTION 238126 - SPLIT SYSTEM AIR CONDITIONER

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Condensing unit package.
- B. Companion indoor fan coil unit.
- C. Internal piping and accessories.
- D. Controls.

1.2 RELATED WORK

- A. Section 230553 - Identification for HVAC Piping and Equipment
- B. Section 230719 - HVAC Piping Insulation
- C. Section 232318 - Refrigerant Piping
- D. Section 232316 - Refrigerant Specialties

1.3 QUALITY ASSURANCE

- A. Conform to requirements of UL and applicable codes and provide units which carry the UL label of approval.
- B. Test and rate cooling systems to ARI Standards 210 and 240.
- C. Unit construction shall comply with ANSI/ASHRAE 15 Safety Code and comply with the NEC (National Electric Code). Unit shall be constructed in accordance with UL standards and shall carry the UL label of approval.
- D. Exterior unit cabinet and finish shall be capable of withstanding a 250 hour salt spray test, Federal Standard 141 or ASTM B117.
- E. Organization performing start-up of refrigeration equipment shall be authorized by equipment manufacturer.

1.4 SUBMITTALS

- A. Submit shop drawings, product data and manufacturer's certificate of 5 year warranty for compressor under provisions of Sections 013300 and 230500.
- B. Submit with shop drawings, schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system. Refrigerant piping schematic including sizes shall be approved by condensing unit manufacturer and submitted with condensing unit.
- C. Submit complete pipe sizing data.
- D. Submit manufacturer's installation instructions under provisions of Sections 013300 and 230500.

- E. Submit resume of organization which will be performing startup of refrigeration systems. Startup shall be performed by vendor's authorized startup organization.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Units will be shipped as a single package, and shall be stored and handled per unit manufacturer's recommendations.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Carrier
- B. Trane
- C. York
- D. Substitutions: Approved equal under provisions of Section 012500.

2.2 GENERAL

- A. Outdoor air-cooled split system compressor sections suitable for on-the-ground, rooftop, wall-hung or balcony mounting. Units consist of a rotary compressor, an air-cooled coil, propeller-type draw-through outdoor fan, reversing valve, accumulator, metering devices, and a control box. Unit functions as the outdoor component of an air-to-air heat pump system.
- B. Indoor, in-ceiling cassette, direct-expansion fan coil are matched with a heat pump outdoor unit.
- C. Provide air cooled condensing unit having a cooling rejection capacity as indicated on the drawings.
- D. Condensing unit at ARI conditions shall have an EER no less than 10.0.
- E. Installation and charging shall conform with latest regulations regarding refrigerant containment and leak prevention.

2.3 MATERIALS

- A. Use corrosion resistant materials for parts in contact with refrigeration.

2.4 CONDENSING UNITS

- A. General: Factory assembled, single piece, air-cooled outdoor unit. Contained within the unit enclosure is all the factory wiring, piping, controls, and the compressor.
- B. Unit Cabinet:
 - 1. Unit cabinet is constructed of galvanized steel, bonderized and coated with a baked-enamel finish on the inside and outside.
 - 2. Unit access panels is removable with minimal screws and provides full access to the compressor, fan, and control components.
 - 3. The outdoor compartment is isolated and has an acoustic lining to assure quiet operation.

C. Fans:

1. Outdoor fans are the direct drive propeller type, and discharges air horizontally. Fans draw air through the outdoor coil.
2. Outdoor fan motors are totally enclosed, single phase motors with class E insulation and permanently lubricated ball bearings. The motor shall be protected by internal thermal overload protection.
3. The shaft has inherent corrosion resistance.
4. Fan blades are non-metallic and statically and dynamically balanced.
5. Outdoor fan openings are equipped with PVC metal/mesh coated protection grille over the fan.

D. Compressor:

1. Compressor is the fully hermetic variable speed rotary type.
2. Compressor is equipped with an oil system, operating oil charge, and a motor.
3. Motor is NEMA rated suitable for operation in a refrigerant atmosphere.
4. Compressor assembly is installed on rubber vibration isolators.

E. Outdoor Coil: The coil is constructed of aluminum hydrophilic pre-coated fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed.

F. Refrigerant Components: Refrigerant circuit components include a brass external liquid line service valves with service gage port connection port, multiple suction line service valves with a service gage connection port, accumulator, reversing valve, and electronic expansion.

G. Controls and Safeties: Operating controls and safeties are factory selected, assembled, and tested. The minimum control functions include the following:

1. Safety:
 - a. Compressor discharge over temperature protection.
 - b. System low voltage protection.
 - c. Compressor overload protection.
 - d. Compressor over current protection.
 - e. IPM module protection.

H. Electrical Requirements:

1. Unit operates on single phase, 60 hz power at 208/230 volt.
2. Unit electrical power has a single point connection.
3. All power and control wiring must be installed per NEC and all local electrical codes.
4. Units have multiple terminal blocks to connect to multiple indoor units.

2.5 INDOOR UNIT

- A. General: Indoor, direct-expansion fan coil. Unit is complete with a cooling/heating coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and an integral temperature sensing.
- B. Unit Cabinet: Unit cabinet is constructed of galvanized steel. The cabinet is fully insulated for improved thermal and acoustic performance.
- C. Fans: The fan is the tangential direct-drive blower type with air intake at the rear or bottom of the unit and discharge at the front.
- D. Coil: The coil is copper tube aluminum fins and galvanized steel tube sheets. Fins are bonded to the tubes by mechanical expansion and specially golden hydrophilic pre-coated for enhanced wet-ability. A drip pan under the coil has a factory installed condensate lift pump and a drain connection for a hose attachment to remove condensate.
- E. Motors: Motors are open-proof, permanently lubricated ball bearing with inherent overload protection. Fan motors are 3-speed.
- F. Controls: Controls consist of a microprocessor-based control system which controls the space temperature, determines the optimum fan speed, and runs self diagnostics. The temperature control range is 62 degrees F to 86 degrees F in increments of 1 degrees F and has a 46 degrees heating mode (Heating Setback). The wireless remote controller, has the ability to act as the temperature sensing location for room comfort.

The unit has the following functions-

- 1. An automatic restart after a power failure at the same operating conditions as at failure.
 - 2. A timer function to provide a minimum 24-hour timer cycle for the system's Auto Start/Stop.
 - 3. Temperature-sensing controls sense the return air temperature.
 - 4. Indoor coil freeze protection.
 - 5. Wireless infrared remote control to enter set points and operating conditions.
 - 6. Dehumidification mode which provided increased latent removal capability by modulating system operation and set point temperature.
 - 7. A fan-only operation to provide room air circulation when no cooling is required.
 - 8. Diagnostics to provide continuous checks of the unit operation and warn of possible malfunctions. Any error messages are displayed at the unit.
 - 9. The fan speed control is user-selectable: high, medium, low, or microprocessor controlled automatic operation during all operating modes.
 - 10. Automatic heating-to-cooling changeover in the heat pump mode. Control includes deadband to prevent rapid mode cycling between heating and cooling.
 - 11. Indoor coil high temperature protection is provided to detect excessive indoor discharge temperature when unit is in the heat pump mode.
- G. Filters: The unit has a filter track with factory-supplied cleanable filters.

- H. Electrical Requirements: The indoor fan motor operates on 208-230V. Power is supplied from the outdoor unit.
- I. Refrigerant Lines: All units should have refrigerant lines that can be oriented to connect from the left, right, or back of unit. Both refrigerant lines must be insulated.
- J. Refrigerant Leak Detection and Mitigation: System comes with refrigerant leak sensor and mitigation system.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide complete structural, mechanical, and electrical connections in accordance with manufacturer's installation instructions.
- B. Furnish charge of refrigerant and oil.

3.2 ADJUSTING

- A. Supply initial charge of refrigerant and oil for each refrigeration system. Replace losses of oil or refrigerant prior to end of correction period. Supply to Owner, one complete charge or lubricating oil in addition to that placed in the system.
- B. Charge system with refrigerant and test entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance. Submit complete report of startup including ambient temperature, suction and discharge, superheat, unloading pressure and running amperage, and check out of low ambient controls.
- C. Inspect and test for refrigerant leaks every month during first year of operation.

3.3 SCHEDULE

- A. Refer to equipment notes on drawings.

3.4 CHECK OUT AND INSPECTION

- A. Inspect and review operation of new split air conditioning systems. Inspect for leaks, put systems into operation and test equipment performance. Submit complete report including ambient temperatures, suction and discharge, superheat, unloading pressure, running amperage, and check out low ambient controls.
- B. Contractor shall provide complete installation and maintain all warranties for all units. Contractor shall provide one year parts and maintenance service for all units.

END OF SECTION 238126