

**SECTION 23 81 26
SPLIT-SYSTEM AIR-CONDITIONERS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Air handling unit.
 - 2. Heat pump unit.

1.2 REFERENCES

- A. Air-Conditioning and Refrigeration Institute:
 - 1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
 - 2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
 - 3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
 - 4. ARI 365 - Commercial and Industrial Unitary Air-Conditioning Condensing Units.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data indicating:
 - 1. Cooling and heating capacities, dimensions, weights, rough-in connections and connection requirements, duct connections, electrical requirements with electrical characteristics and connection requirements, controls and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of controls installed remotely from units.

1.5 QUALITY ASSURANCE

- A. Performance Requirements: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 when used in combination with compressors and evaporator coils.
- B. Cooling Capacity: Rate in accordance with ARI 210/240, ARI 340/360, ARI 365.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept units and components on site in factory protective containers, with factory shipping skids and lifting lugs. Inspect for damage.

1.7 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Coordinate installation of condensing units with concrete pad or roof structure.

- C. Coordinate installation of air handling units with building structure.

1.8 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish five year manufacturers warranty for compressors.

1.9 MAINTENANCE MATERIALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Furnish one set for each unit of filters.

PART 2 PRODUCTS

2.1 SPLIT SYSTEM AIR CONDITIONING UNITS

- A. Manufacturers:
 - 1. Carrier Corp.
 - 2. Lennox International.
 - 3. McQuay International.
 - 4. The Trane Company.
 - 5. York International.
- B. Product Description: Split system consisting of air handling unit and heat pump unit including cabinet, evaporator fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, electric heating coil, air filters, controls, air handling unit accessories, heat pump unit accessories, and refrigeration specialties.

2.2 AIR HANDLING UNIT

- A. Configuration: Upflow or horizontal air delivery as indicated on drawings.
- B. Cabinet:
 - 1. Panels: Constructed of galvanized steel with baked enamel finish. Access Panels: Located on both sides of unit. Furnish with duct collars on inlets and outlets.
 - 2. Insulation: Factory applied to each surface to insulate entire cabinet. 1/2 inch thick neoprene coated glass fiber with edges protected from erosion.
- C. Evaporator Fan: Forward curved centrifugal type, resiliently mounted with adjustable belt drive and high efficiency motor complying with NEMA MG1, Type 1. Motor permanently lubricated with built-in thermal overload protection.
- D. Evaporator Coil: Constructed of copper tubes expanded onto aluminum fins. Factory leak tested under water. Removable, PVC construction, double-sloped drain pan with piping connections on both sides.
- E. Refrigeration System: Single or dual refrigeration circuits controlled by factory installed thermal expansion valve.
- F. Electric Heating Coil: Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in contactors, galvanized steel frame, control circuit transformer and fuse, manual reset thermal cut-

out, air flow proving device, pilot duty toggle switch, load fuses. Number of stages as indicated on Drawings.

- G. Air Filters: 1 inch thick glass fiber disposable media in metal frames. 25 to 30 percent efficiency based on ASHRAE 52.1.
- H. Air Handling Unit Accessories:
 - 1. Discharge Plenum: with construction and finish matching unit casing. Integral grille of aluminum construction and adjustable louvers.
 - 2. Mounting Subbase with construction and finish matching unit casing.
 - 3. Vibration Isolators: Neoprene-in-shear type.

2.3 HEAT PUMP UNIT

- A. General: Factory assembled and tested air cooled heat pump units, consisting of casing, compressors, condensers, coils, condenser fans and motors, and unit controls.
- B. Unit Casings: Exposed casing surfaces constructed of galvanized steel with manufacturer's standard baked enamel finish. Designed for outdoor installation and complete with weather protection for components and controls, and complete with removable panels for required access to compressors, controls, condenser fans, motors, and drives.
- C. Compressor: Semi-hermetic reciprocating type compressors, resiliently mounted, with positive lubrication, and internal motor overload protection.
- D. Condenser Coil: Constructed of copper tubing mechanically bonded to aluminum fins, factory leak and pressure tested.
- E. Controls: Furnish operating and safety controls including high and low pressure cutouts. Control transformer. Furnish magnetic contactors for compressor and condenser fan motors.
- F. Condenser Fans and Drives: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Permanently lubricated ball bearing type motors with built-in thermal overload protection.
- G. Heat Pump Unit Accessories: Furnish the following accessories:
 - 1. Controls to provide low ambient cooling to 0 degrees F.
 - 2. Time delay relay.
 - 3. Anti-short cycle timer.
 - 4. Disconnect switch.
 - 5. Vibration isolators.
 - 6. Hot gas bypass kit.
 - 7. Coil with corrosion resistant coating capable of withstanding salt spray test of 1000 hours in accordance with ASTM B117.
 - 8. Condenser Coil Guard: Condenser fan openings furnished with PVC coated steel wire safety guards.
 - 9. Suction and discharge pressure gauges.
- H. Refrigeration specialties: Furnish the following for each circuit:
 - 1. Charge of compressor oil.
 - 2. Holding charge of refrigerant.
 - 3. Replaceable core type filter drier.
 - 4. Liquid line sight glass and moisture indicator.
 - 5. Shut-off valves on suction and liquid piping.
 - 6. Liquid line solenoid valve.
 - 7. Charging valve.
 - 8. Oil level sight glass.

- 9. Crankcase heater.
- 10. Hot gas muffler.
- 11. Pressure relief device.

I. Refrigerant: Furnish charge of refrigerant R-410 A.

2.4 CONTROLS

- A. Thermostat: 7 day programmable electronic space thermostat to control electric heating coil for heating and single or two stage cooling with automatic changeover and heating setback and cooling setup capability. Furnish system selector switch, off-heat-auto-cool and fan control switch, auto-on.

2.5 ELECTRICAL COMPONENTS

- A. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify concrete pad or structural framing for heat pump unit is ready for unit installation.

3.2 INSTALLATION - AIR HANDLING UNIT

- A. Install air handling units on vibration isolators.
- B. Connect air handling units to supply and return ductwork with flexible connections.
- C. Install condensate piping with trap and route from drain pan to condensate drainage system.
- D. Install components furnished loose for field mounting.
- E. Connection to electrical power wiring by Electrical Contractor.

3.3 INSTALLATION - HEAT PUMP UNIT

- A. Install units on concrete foundations.
- B. Install refrigerant piping from unit to heat pump unit. Install refrigerant specialties.
- C. Evacuate refrigerant piping and install initial charge of refrigerant.
- D. Install electrical devices furnished loose for field mounting.
- E. Install control wiring between air handling unit, heat pump unit, and field installed accessories.
- F. Connection to electrical power wiring by Electrical Contractor.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Section 01 40 00 - Quality Requirements: Requirements for manufacturer's field services.
- B. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of unit cabinet.
- C. Install new throwaway filters in units at Substantial Completion.

3.6 PROTECTION OF FINISHED WORK

- A. Do not operate air handling units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 23 81 26