

SECTION 15738 - SPLIT-SYSTEM AIR-CONDITIONING AND HYDRO-HEAT UNITS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes split-system air-conditioning and hydro-heat air handling units consisting of separate evaporator-fan, compressor-condenser components and condensate removal pump. Units are designed for exposed or concealed mounting, and may be connected to ducts.
- B. Related Sections include the following:
 - 1. Division 15 Section "Water Distribution Piping".

1.03 DEFINITIONS

- A. Hydro-Heat Air Handling: The part of the split-system air-conditioning unit that contains a DX coil for cooling, a hot water coil for heating, built-in circulating pump and a fan to circulate air to conditioned space.
- B. Compressor-Condenser Unit: The part of the split-system air-conditioning unit that contains a refrigerant compressor and a coil for condensing refrigerant.

1.04 SUBMITTALS

- A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each type of product indicated. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Shop Drawings: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.
- C. Maintenance Data: For split-system air-conditioning and hydro-heat units to include in maintenance manuals specified in Division 1. Include a parts list for each condensing unit, air handling unit, controls and accessories; trouble-shooting maintenance guide; and servicing and preventative maintenance procedures and schedule.
- D. Warranties: Special warranties specified in this Section.

1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Perform work in accordance with ANSI/ASHRAE 15, 2000 International Mechanical Code and Plumbing Code.

1.06 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace

components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

- C. Warranty Period: Manufacturer's standard but not less than five years from date of substantial completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide condensing unit by one of the following:
 - 1. Rheem Air Conditioning Division
- B. Manufacturers: Subject to compliance with requirements, provide hydro-heat air handling unit by one of the following:
 - 1. The First Company
 - 2. Air Distributor Products
 - 3. Apollo Heating and Cooling
 - 4. Mor-Flo/American
 - 5. Bosch

2.02 AIR HANDLERS

- A. System: UL listed electrical components, factory assembled piped, wired and tested, complete with pump, heating coil, cooling coil, thermostat, and separate condensate removal pump.
- B. Air Handler: Includes copper tube hot water heating and DX cooling coils, circulating pump, air purge valve, hot water check valve, blower door safety switch, two speed blower motor, throwaway filter, expansion valve kit, 24V control, and freeze protector. Insulated cabinet with supply air duct connection on top and return air duct connection on bottom.
- C. Wall Thermostat: 24 VAC, single stage, adjustable, heating - cooling, wall mounting unit with fan ON-AUTOMATIC selector, electronic type with auto-changeover, clean filter reminder, permanent memory and equipment "ON" indicator. When space heating is needed, thermostat shall energize the circulating pump which circulates hot water from the water heater to the hot water coil.
- D. Condensate Removal Pump: Large capacity type, with plastic housing, safety float, check valve, vinyl discharge tubing, and high level switch to shut off air handling unit; Beckett Model No. CU40-1UL, 1/25 HP, 120 watts, 120/1/60, 45 GPM at 15 FT. HD., 1.0 gallon tank size.

2.03 AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS

- A. Casing: Steel, powder painted, 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 interior of casing. Equipment with valves or fittings on exterior of casing will not be accepted.
- B. Compressor: Hermetically sealed with internal high temperature motor overload protection and double insulation on motor windings. Compressor shall be mounted on vibration isolation and shall have internal pressure relief assembly.
 - 1. Compressor Type: Scroll.
- C. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with liquid sub-cooler.
- D. Fan: Aluminum-propeller type, directly connected to motor.

- E. Motor: Permanently lubricated, with integral thermal-overload protection.
- F. Low Ambient Kit: Permits operation down to 0 deg F.

2.04 ACCESSORIES

- A. Thermostat: Low voltage with sub-base to control compressor and evaporator fan.
- B. Automatic-reset timer to prevent rapid cycling of compressor.
- C. 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.
- D. Miscellaneous: Compressor vibration isolator plate; sound hood to muffle noise; coil guard; thermostatic expansion valve; winter start control.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit and in accordance with manufacturer's written instructions.
- D. Verify that proper power supply is available for unit.
- E. Verify that proper water piping configuration has been installed per manufacturer's written instructions.
- F. Route condensate drain tubing (3/8" \AA) in minimum 3/4" schedule 40 PVC with solvent cement joints.

3.02 CONNECTIONS

- A. Water piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to unit to allow service and maintenance.
- C. Unless otherwise indicated, connect piping with unions and shutoff valves to allow units to be disconnected without draining piping. Refer to piping system Sections for specific valve and specialty arrangements.
- D. Ground equipment.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- E. Install devices provided with air handling unit but not specified to be factory mounted.

3.03 FIELD QUALITY CONTROL

- A. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
- B. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new components, and

retest.

- C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. After completing system installation, including outlet fittings and devices, inspect exposed finish. Clean units to remove dirt and construction debris and repair damaged finishes.

3.04 COMMISSIONING

- A. Verify that units are installed and connected according to the Contract Documents.
- B. Lubricate bearings, adjust belt tension, and change filters.
- C. Perform startup checks according to manufacturer's written instructions and do the following:
 - 1. Fill out manufacturer's checklists.
 - 2. Check for unobstructed airflow over coils.
 - 3. Check operation of condenser capacity-control device.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.
 - 1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining units.
 - 2. Review data in maintenance manuals. Refer to Division 1 Section "Closeout Procedures."
 - 3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

3.06 EQUIPMENT SCHEDULE

- A. Outdoor Units: Rheem Model RAND-A Series, 13 SEER, w/factory installed low & high pressure controls and liquid line filter drier, and enclosed service valves. Provide field installed compressor time delay control and low ambient switch.
 - 1. Two Bedroom Units: Model RAND-018-A, Nom. 1-1/2 tons cooling at ARI conditions, 208/1/60, 13 MCA, 20 MOCP.
 - 2. Three Bedroom Units: Model RAND-024-A, Nom. 2 tons cooling at ARI conditions, 208/1/60, 15 MCA, 25 MOCP.
 - 3. Four Bedroom Units: Model RAND-030-A, Nom. 2-1/2 tons cooling at ARI conditions, 208/1/60, 19 MCA, 30 MOCP.
- B. Air Handling Units: First Company Aqua-Therm HBQB Series; Vertical air handler with DX cooling and hot water heating coils.
 - 1. Two Bedroom Units: Model 24 HBQB, Nom. 24.0 MBH cooling, 3-1/2 GPM hot water flow, 4.3 Ft. H2O PD, 35.3 MBH heating at 140 deg F EWT, 820 CFM at 0.20" ESP, 1/5 HP at 120/1/60, 7 MCA, 15 MOCP.
 - 2. Three Bedroom Units: Model 30 HBQB, Nom. 30.0 MBH cooling, 3-1/2 GPM hot water flow, 5.0 Ft. H2O PD, 43.6 MBH heating at 140 deg F EWT, 1030 CFM at 0.20" ESP, 1/5 HP at 120/1/60, 7 MCA, 15 MOCP.
 - 3. Four Bedroom Units: Model 30 HBQB, Nom. 30.0 MBH cooling, 3-1/2 GPM hot water flow, 5.0 Ft. H2O PD, 43.6 MBH heating at 140 deg F EWT, 1030 CFM at 0.20" ESP, 1/5 HP at 120/1/60, 7 MCA, 15 MOCP.

END OF SECTION 15738