

SECTION 15750

PACKAGED ROOFTOP AIR CONDITIONING UNITS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for roof mounted, self-contained units, with electric cooling, and electric or reverse refrigeration cycle (heat pump) heating and related controls; including:
 - 1. Packaged rooftop unit
 - 2. Controls
 - 3. Remote panel
 - 4. Roof mounting frame and base
 - 5. Maintenance service

1.02 REFERENCES

- A. Air Conditioning and Refrigeration Institute (ARI)
 - 1. 210/240 Performance Rating of Unitary Air-Conditioning and Air-Source Heatpump Equipment
 - 2. 270 Sound Rating of Outdoor Unitary Equipment
- B. National Fire Protection Association (NFPA):
 - 3. 90A Installation of Air-Conditioning and Ventilation Systems

1.03 SUBMITTALS

- A. Product data and schematic layouts showing condensing units, cooling coils, refrigerant piping and accessories required for complete system. Include complete pipe sizing data.
 - 1. Include rated capacities, dimensions, weights, accessories, required clearances, electrical requirements, wiring diagrams and location and size of field connections.
- B. Manufacturer's installation instructions
- C. Operation and maintenance manual (O&M Manual)

1.04 MAINTENANCE SERVICE

- A. Furnish complete service and maintenance of packaged rooftop units for one year from date of substantial completion.

- B. Provide maintenance service with a two month interval as maximum time period between calls. Provide 24-hour emergency service on breakdowns and malfunctions.
- C. Include maintenance items as outlined in manufacturer's operating and maintenance data including minimum of six filter replacements, minimum of one fan belt replacement and controls checkout, adjustments and recalibrations.
- D. Submit copy of service call work order or report and include description of work performed.

1.05 EXTRA MATERIALS

- A. Provide one set of filters.

1.06 WARRANTY

- A. Provide five-year manufacturer's material replacement warranty for compressor.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Carrier Corp.
- B. AAON, Inc.
- C. Trane Co.
- D. Or Engineer approved equal

2.02 MANUFACTURED UNITS

- A. Provide roof mounted units complete with electric heating elements and electric refrigeration as scheduled.
- B. Provide units which are self-contained, packaged, factory assembled and prewired consisting of insulated cabinet and frame, supply fan, electric heating elements, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

2.03 MATERIALS

- A. Cabinet: Galvanized steel with baked enamel finish, access doors or removable access panels, with quick fasteners, screwdriver operated flush cam type or locking door handle type with piano hinges. Provide structural members a minimum of 18 gage with access doors or removable panels a minimum of 20 gage.
- B. Insulation: 1 inch thick neoprene coated glass fiber on surfaces where conditioned air is handled. Protect edges from erosion.
- C. Supply Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch motor pulley and rubber isolated hinge mounted motor or direct drive. Isolate complete fan assembly.

- D. Air Filters: 1-inch thick permanent washable.
- E. Roof Mounting Frame: 14-inch high galvanized steel channel frame with gaskets and nailer strips.

2.04 EVAPORATOR COIL

- A. Provide copper or aluminum tube and aluminum fin assembly with galvanized drain pan and connection.
- B. Provide thermostatic expansion valves and alternate row circuiting for units 7-1/2 tons cooling capacity and larger.

2.05 COMPRESSOR

- A. Provide the compressor which is hermetic or semi-hermetic, 3600 rotations per minute maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gage ports, and filter dryer.
- B. Delay compressor start with five minute timed off circuit.
- C. Provide outdoor thermostat which will energize compressor control circuit above 35 degrees F ambient.
- D. For heat pump units, provide reversing valve, suction line accumulator, discharge muffler, flow control check valve and solid state defrost control utilizing thermistors.
- E. Provide hot gas bypass or cycling compressors for capacity control.

2.06 CONDENSER

- A. Provide coil with copper or aluminum tube and aluminum fin assembly with subcooling rows.
- B. Provide condenser fans which are direct drive propeller fans, resiliently mounted with fan guard, motor overload protection wired to operate with compressor.
- C. Provide heat pressure control by refrigerant pressure switches cycling the condenser fans for unit operation down to 35 degrees F outdoor temperature.

2.07 SUPPLY/RETURN CASING

- A. Dampers: Provide outside, return and relief dampers with damper operator and control package to automatically vary outside air quantity.
- B. Gaskets: Provide tight fitting dampers with edge gasket, maximum leakage 5 percent at 2 inches WC pressure differential.
- C. Damper Operator: Provide 24 volt with gear train sealed in oil with spring return on units 7-1/2 tons cooling capacity and larger.

2.08 OPERATING CONTROLS - SINGLE ZONE UNITS

- A. Electric solid state microcomputer based room thermostat located as indicated in service area with remote sensor located as indicated.
- B. Incorporate the following in room thermostat:
 - 1. Automatic switching from heating to cooling
 - 2. Preferential rate control to minimize overshoot and deviation from set point
 - 3. Set-up for four separate temperatures per day
 - 4. Instant override of set point for continuous or timed period from one hour to 31 days
 - 5. Short cycle protection
 - 6. Programming based on weekdays, Saturday and Sunday
 - 7. Switch selection features including imperial or metric display, 12 or 24-hour clock, keyboard disable, remote sensor, fan ON-AUTO switch
- C. Include room thermostat display as follows:
 - 1. Time of day
 - 2. Actual room temperature
 - 3. Programmed temperature
 - 4. Programmed time
 - 5. Duration of timed override
 - 6. Day of work
 - 7. System model indication: heating, cooling, auto, off, fan auto and fan on
 - 8. Stage (heating or cooling) operation

2.09 PERFORMANCE

- A. Base performance on ARI 210/240 test conditions unless specified otherwise. Sound rating numbers are in accordance with ARI 270.
- B. Rated heating and cooling capacities shall be as scheduled on the Contract Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that proper power supply is available.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions and NFPA 90A.
- B. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork and utility services. Install roof mounting frame level.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide initial startup and shutdown during first year of operation including routine servicing and checkout.

END OF SECTION