

## SECTION 15610 FORCED AIR FURNACES

## PART 1 GENERAL

## 1.1 WORK INCLUDED:

- A. Forced air furnaces.
- B. Refrigerant cooling coil and condenser.
- C. Controls.

## 1.2 QUALITY ASSURANCE:

- A. Conform to requirements of UL and applicable codes.
- B. Cooling system tested and rated to ARI Standard 210.

## 1.3 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical product data and installation instructions for forced air furnace systems materials and products.
- B. Submit shop drawings and product data in accordance with Section 15010 showing dimensions, connections, arrangement, accessories, flue sizing recommendations and controls.
- C. Submit manufacturer's installation instructions.
- D. Submit manufacturer's descriptive literature, operating instructions, and maintenance and repair data.
- E. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to compressed air equipment. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
- F. Record Drawings: At project closeout, submit record drawings of installed systems products; in accordance with requirements of Division 15.
- G. Maintenance Data: Submit maintenance data and parts lists for compressed air systems materials and products. Include this data, product data, shop drawings, record drawings, and wiring diagrams in maintenance manual; in accordance with requirements of Division 15.

## 1.4 WARRANTY:

- A. Provide 5 year parts warranty on heat exchangers.
- B. Provide 5 year warranty on compressors.

## PART 2 PRODUCTS

## 2.1 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Forced Air Furnaces:
    - a. Rheem

- b. Fedders
- c. York
- d. Lennox
- e. Trane

## 2.2 TYPE:

- A. Provide upflow or counterflow type (as shown on the drawings) with gas burner and electric refrigeration.
- B. Provide self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heat exchanger, burner or heater, controls, air filter, refrigerant cooling coil and outdoor package containing compressor, condenser coil and condenser fan.

## 2.3 CONSTRUCTION:

- A. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation and reflective liner and welded steel base.
- B. Heat Exchanger: Cold rolled steel construction.
- C. Burners shall be aluminized steel with crossover igniter of burner ports.
- D. Supply Fan: Centrifugal type, rubber mounted with direct or belt drive, with adjustable variable pitch motor pulley or rubber isolated hinge mounted multispeed motor.
- E. Air Filters: 1 inch (25 mm) thick glass fiber, disposable type arranged for easy replacement. Provide pleated type with 30 percent Eff. rating.

## 2.4 BURNER:

- A. Gas Burner: Atmospheric or induced draft type with adjustable combustion air supply, equipped with combustion gas valve and pressure regulator incorporating manual shut-off, pilot valve, automatic 100 percent shut-off, and thermocouple pilot safety device. Provide with spark pilot ignition.
- B. Gas Burner Safety Controls: Thermocouple sensor prevents opening of solenoid gas valve until pilot flame is proven and stops gas flow on ignition failure.

## 2.5 BURNER OPERATING CONTROLS:

- A. Provide low voltage, adjustable room heating-cooling thermostats, to control burner operation to maintain room temperature settings.
- B. Provide high limit control, with fixed stop at maximum permissible setting, to de-energize burner on excessive bonnet temperature and energize burner when temperature drops to lower safe value.
- C. Provide controls for supply fan in accordance with bonnet temperatures independent of burner controls. Include manual switch for continuous fan operation.
- D. Provide safety interlock switch located in wiring junction box which shall automatically turn power off to unit when blower access panel is removed.
- E. See drawing schedules for alternate options to be provided.

**2.6 DRAFT CONTROL:**

- A. Provide each furnace with galvanized steel flue pipe having airtight joints.
- B. For gas burner, provide furnace with draft diverter.

**2.7 EVAPORATOR COIL:**

- A. Mount in furnace supply plenum copper tube aluminum fin coil assembly, with galvanized drain pan, 3/4inch drain connection, refrigerant piping connections. Provide with coil cabinet and adapter bases where required by manufacturer.
- B. Provide factory installed thermostatic expansion valve kit including expansion and check valve.

**2.8 REFRIGERATION PACKAGE:**

- A. Compressor: Hermetically sealed, 3600 rpm maximum, resiliently mounted integral with condenser, with positive lubrication, crankcase heater, high pressure control, motor overload protection, service valves, and drier.
- B. Air Cooled Condenser: Aluminum fin and copper tube coil, direct drive propeller fan resiliently mounted, galvanized or PVC fan guard, mounting base.
- C. Provide capacity ratings derived in accordance with ARI and DOE tests procedures. Provide certification of ARI on each unit. Provide units with UL listing.
- D. Provide two-speed condenser where scheduled on drawings.

**2.9 REFRIGERATION OPERATING CONTROLS:**

- A. Low voltage, adjustable thermostat controls compressor, condenser fan and supply fan to maintain room temperature setting. Provide remote return air temperature sensor behind return air grille in location shown.
- B. Include thermostat system selector switch (heat-cool-off) and fan control switch (on-auto). Locate in corresponding mechanical room.
- C. Timed off circuit shall limit number of compressor starts to 12 per hour.
- D. Provide refrigerant pressure switch to cycle condenser fan.

**PART 3 EXECUTION****3.1 INSTALLATION:**

- A. Mount counterflow furnaces installed on combustible floors, on additive base.
- B. Mount air cooled condenser package on concrete mounting pad. Pad by General Contractor.

END OF SECTION 15610