

## SECTION 236710 – AIR-COOLED CONDENSING UNITS/HEAT PUMPS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Condensing units
- B. Heat pumps

#### 1.2 SUBMITTALS

- A. Submit product data indicating rated capacities, weights specialties and accessories, electrical nameplate data, and wiring diagrams.
- B. Submit design data indicating refrigerant pipe sizing and refrigerant charge.
- C. After-market protective coil coating product data and application instructions.
- D. Warranty certificates.

#### 1.3 OPERATION AND MAINTENANCE DATA

- A. Include start-up instructions, maintenance instructions, parts list, controls, and accessories.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.
- B. Protect units on site from physical damage.

#### 1.5 WARRANTY

- A. Warranty: Units shall be warranted to be free from defects in material and workmanship under normal use and maintenance for a period of one year from the date of original installation or 18 months from the date of manufacture. Compressors shall be warranted for 5 years.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering similar products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. First Company
  - 2. Goodman
  - 3. Trane
  - 4. Carrier
  - 5. Desert-Aire

### 2.2 MANUFACTURED UNITS

- A. Outdoor Units: Self-contained, packaged, factory assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, coil, fan(s), and controls, and louvered coil guards.
- B. Through-the-Wall Units: Self-contained, packaged, factory assembled and pre-wired units suitable for through-the-wall use consisting of cabinet, compressors, coil, fan, controls, wall sleeve, and architectural louver.
- C. Construction and Ratings: In accordance with ARI 210/240. Testing shall be in accordance with ASHRAE 14.
- D. Performance Ratings: Energy Efficiency Rating (EER) not less than prescribed by ANSI/ASHRAE 90A.

### 2.3 CASING

- A. House components in welded steel frame with galvanized steel panels with weather resistant, baked enamel finish. Mount starters, disconnects, and controls in weatherproof panel provided with full opening access doors. Provide mechanical interlock to disconnect power when door is opened.

### 2.4 CONDENSER COILS

- A. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Air test under water to 425 psig, and dehydrate.
- B. Coil Guard: Expanded metal

## 2.5 FANS AND MOTORS

- A. Outdoor Units: Vertical discharge direct driven propeller type condenser fan with fan guard on discharge. Waterproof motors suitable for outdoor use, single phase permanent split capacitor or 3 phase, with permanent lubricated ball bearings and built in thermal overload protection.
- B. Through-the-Wall Units: Horizontal intake and discharge direct-driven condenser fan with fan guard on discharge. High-efficiency, ECM, waterproof motors suitable for outdoor use, single phase permanent split capacitor or 3 phase, with permanent lubricated ball bearings and built in thermal overload protection.

## 2.6 COMPRESSORS

- A. Hermetic scroll type.
- B. Mounting: Statically and dynamically balance rotating parts and mount on rubber-in-shear vibration isolators. Internally isolate hermetic units on springs.
- C. Lubrication System: Reversible, positive displacement oil pump with oil charging valve, oil level sight glass, oil filter, and magnetic plug or strainer.
- D. Capacity Reduction Equipment: Suction valve unloaders, with lifting mechanism operated by electrically actuated solenoid valve. Provide for unloaded compressor start. Control unloading from suction pressure.
- E. Motor: Constant speed suction gas cooled with electronic sensor and winding over temperature protection, designed for across-the-line starting. Furnish with starter.
- F. Crankcase Heater: Evaporates refrigerant returning to crankcase during shut down. Energize heater thermostatically when compressor is not operating.

## 2.7 REFRIGERANT CIRCUIT

- A. Provide each unit with one refrigerant circuit factory-supplied and piped.
- B. Refrigerant: R-410A
- C. Provide the following for each refrigerant circuit:
  - 1. Filter dryer
  - 2. Liquid line sight glass and moisture indicator
  - 3. Thermal expansion valve for maximum operating pressure
  - 4. Insulated suction line

5. Suction and liquid line service valves and gauge ports
6. Liquid line solenoid valve
7. Charging valve
8. Discharge line check valve
9. Compressor discharge service valve
10. Condenser pressure relief valve

D. Provide the following for each heat pump refrigerant circuit:

1. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.

## 2.8 CONTROLS

- A. On unit, mount weatherproof steel control panel, NEMA 250, containing power and control wiring, molded case disconnect switch, factory wired with single point power connection.
- B. For each compressor, provide across-the-line starter, non-recycling compressor overload, starter relay, and control power transformer or terminal for controls power. Provide manual reset current overload protection. For each condenser fan, provide across-the-line starter with starter relay.
- C. Provide the following safety controls arranged so that operating any one will shut down machine and require manual reset:
1. High discharge pressure switch (manual reset)
  2. Low suction pressure switch (automatic reset)
  3. Oil Pressure switch (manual reset)
- D. Provide the following operating controls:
1. Thermostat located in room cycles compressors, activates solenoid valves in refrigerant circuit.
  2. Five minute off timer prevents compressor from short cycling.
- E. Room thermostat: Refer to schedule on Contract Drawings for more information.

## 2.9 COIL PROTECTIVE COATING

- A. Protective Coil Coating: Spray-on, protective coating – Adsil, MicroGuard HVAC/R protective treatments or engineer-approved equal. All outdoor coils shall be protected.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide for connection to electrical service.
- C. Install outdoor units on concrete or fiberglass base as indicated on the Contract Drawings.
- D. Provide wall sleeves and architectural louvers for through-the-wall units. Install per Manufacturer's written instructions and seal all building penetrations weather-tight.
- E. Provide connection to refrigeration piping system and evaporators. Comply with ANSI/ASHRAE 15.
- F. Refrigerant pipe sizing and routing shall be the responsibility of the Mechanical Contractor.
- G. Provide all accessories required for long-line applications and size refrigerant pipe per the Manufacturer's instructions for the length of refrigerant run. Adjust the refrigerant charge for the line length per the Manufacturer's instructions.
- H. Apply protective coil coatings per the coating Manufacturer's written instructions.

END OF SECTION 236710