

SECTION 15670
AIR COOLED AIR CONDITIONING CONDENSING UNITS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. The other Contract Documents complement the requirements of this section. The General Requirements apply to the work to this section.

1.2 SCOPE

- A. Provide material, equipment, labor and supervision necessary to install air-cooled condensing units.
- B. Unit ratings, capacities, and characteristics shall be as scheduled on Mechanical Drawings.

1.3 STANDARDS

- A. Performance shall be in accordance with the applicable ARI Standards.
- B. Compressor motors, starters, wiring and control wiring shall all conform to NEMA, UL, NEC and local utility requirements.

1.4 SECTION INCLUDES:

- A. Condensing unit package.
- B. Charge of refrigerant and oil.
- C. Controls and control connections.
- D. Refrigerant piping connections.
- E. Motor starters.
- F. Electrical power connections.

1.5 SUBMITTALS

- A. Submit shop drawings indicating components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Include schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01700.
- B. Include start-up instructions, maintenance instructions, parts lists, controls, and accessories.

1.7 WARRANTY

- A. Provide five year extended replacement warranty (parts only) on compressor and factory pre-charged and sealed refrigerant system including condenser coils.
- B. First Year Warranty: Include material coverage for refrigerant compressors; condenser coils, fans, controls electrical devices and related system components.

1.8 MANUFACTURERS

- A. Provide products by one of the following:
 - 1. Trane
 - 2. Carrier
 - 3. York
 - 4. Engineer and Owner approved equal.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

- A. Units: Self-contained, packaged, factory assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, condensing coil and fans, integral sub-cooling coil, controls, liquid receiver, and screens.
- B. Construction and Ratings: In accordance with ARI 210/240. Testing shall be in accordance with ASHRAE 14.
- C. Performance Ratings: Energy Efficiency Rating EER not less than 14 or as prescribed by ANSI/ASHRAE 90A, and the "Energy Efficiency Code for Building Construction".
- D. See Schedule on Drawings for unit capacities, electrical characteristics and performance criteria.
- E. Provide unit with a holding charge of refrigerant and oil. Refrigerant to be R-410A or equal.

2.2 CASING

- A. House components in welded frame with steel panels with weather resistant, baked enamel finish.
- B. Mount starters, disconnects, and controls in weatherproof panel provided with full opening access doors.
- C. Provide removable access doors or panels with piano hinges and quick fasteners.

2.3 CONDENSER COILS

- A. Coils: Aluminum plate fins mechanically bonded to seamless copper tubing. Provide sub-cooling circuits. Air test under water to 425 psig, and vacuum dehydrate. Seal with holding charge of refrigerant
- B. ALL condenser coils shall have corrosion protective coating. Provide condenser coil coating as specified in design documents. Approved coil coating materials and methods shall include one of the following:
 - 1. Process equal to the Bronz-Glow as patented and manufactured by Bronz-Glow Southeast Corp. (Jacksonville, FL).
 - 2. Coating process by Eisenheiss and Heresite
 - 3. Field applied Oxiguard.
- C. All coating materials and methods must pass a minimum of 3000 hours of salt spray exposure in a testing performed by an independent laboratory in accordance with ASTM B117.85. The company providing coating process shall also provide a five-year coil limited warranty.

2.4 FANS AND MOTORS

- A. Vertical discharge direct driven propeller type condenser fans with fan guard on discharge. Equip with roller or ball bearings with grease fittings extended to outside of casing.
- B. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor or 3 phase, with permanent lubricated ball bearings and built in thermal overload protection.
- C. High efficiency motors as indicated.

2.5 COMPRESSORS

- A. Construction: Hermetic, scroll and reciprocating type with heat treated forged steel or cast iron shafts, aluminum alloy connecting rods, automotive type pistons, rings to prevent gas leakage, suction and discharge valves, and sealing surface immersed in oil.
- B. Mounting: Statically and dynamically balance rotating parts and mount on spring 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. Motor: Constant speed suction gas cooled with electronic sensor and winding over temperature protection, designed for across-the-line starting. Furnish with starter.
- E. Crankcase Heater: Evaporates refrigerant returning to crankcase during shut down. Energize heater continuously and when compressor is not operating.

2.6 REFRIGERANT CIRCUIT

- A. Provide each unit with two speed compressors or dual refrigerant circuit, factory supplied and piped. If dual refrigerant circuits are used the AHU evaporator coil must be circuited to provide individual circuits and expansion valves for each compressor, and individual piping runs installed.

2.7 CONTROLS

- A. On unit, mount weatherproof steel control panel, NEMA 250, containing power and control wiring, factory wired with single point power connection.
- B. For each compressor, provide across-the-line starter with dual pole contactor, minimum 3-minute (or manufacturer standard) anti-cycling time delay compressor overload 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) for each compressor.
 - 2. Low suction pressure switch (manual reset) for each compressor.
 - 3. Oil Pressure switch (manual reset).
- D. The installing contractor shall perform any control field wiring required.

PART 3 EXECUTION

3.1 INSTALLATION

- A. The Contractor shall install equipment in accordance with manufacturer's instructions.
- B. Provide for connection to electrical service. Refer to Division 16.
- C. Install units on concrete base as indicated.
- D. Provide connection to refrigeration piping system and evaporators. The Contractor shall provide and install the following for each refrigerant circuit:
 - 1. Suction and liquid line filter dryer replaceable core type.
 - 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 gage ports.

- 6. Charging valves.
- 7. Refrigerant and oil.
- E. Refer to Section 15535. Comply with ANSI/ASHRAE 15.

3.2 CONTRACTOR'S FIELD SERVICES

- A. Test refrigerant system for leaks including lines connecting the condensing unit with air handling unit.
- B. Prepare and start systems.
- C. Supply initial charge of refrigerant and oil for each refrigerant circuit. Replace losses of refrigerant and oil.
- D. Inspect and test for refrigerant leaks quarterly during first year of operation. Repair all leaks and replace losses of refrigerant and oil to meet manufacturer's specifications.

END OF SECTION