

SECTION 15743 - AIR COOLED CONDENSERS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. This Section includes
 - 1. Air cooled condensers.
- B. Refer to other Division-15 Sections for piping; vibration controls; temperature control ;not work of this section.
- C. Refer to Division-16 sections for the following work; not work of this section.
 - 1. Power supply wiring from power source to power connection on condensers. Include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer.
 - 2. Interlock wiring between condensers; and between condensers and field-installed control devices.
 - a. Interlock wiring specified as factory-installed is work of this section.
- D. Provide the following electrical work as work of this section, complying with requirements of Division-16 sections:
 - 1. Control wiring between field-installed controls, indicating devices, and condensers control panels.
 - a. Control wiring specified as work of Division-15 for Automatic Temperature Controls is work of that section.

1.2 REFRIGERANTS:

- A. All refrigerants used for each condensing unit shall be on the latest EPA list of approved refrigerants & environmentally friendly.
- B. No CFC based refrigerants shall be used.

1.3 SUBMITTALS:

- A. Each manufacturer shall describe in writing, how their company is addressing the CFC legislation issue. Provide equipment capable of accepting a substitute refrigerant. The equipment provided shall provide the scheduled capacity when the substitute refrigerant proposed, the nominal equipment capacity reduction effects (if any), performance in KW/TON, the refrigerant change out procedure and long term maintenance effects the new refrigerant has on the equipment.
- B. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, weights (shipping, installed, and operating), furnished specialties and accessories; and installation and start-up instructions.
- C. Shop Drawings: Submit shop drawings detailing dimensions, required clearances, methods of assembly of components, and mounting and connection details.

- D. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to units. Submit manufacturer's ladder type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions that must be field installed.
 - E. Record Drawings: At project closeout, submit record drawings of installed systems products in accordance with requirements of Division 15.
 - F. Maintenance Data: Submit maintenance data and parts list for each air cooled condenser, control and accessory; including "trouble-shooting" maintenance guide. Include this data and product data in maintenance manual; in accordance with requirements of Division 15.
 - G. Quality Control Submittals:
 - 1. Submit certification of compliance with specified ARI, UL, AND ASHRAE fabrication requirements.
 - 2. Submit certification of compliance with performance verification requirements specified in Part 2 of this Section.
- 1.4 QUALITY ASSURANCE:
- A. Codes and Standards:
 - 1. Capacity ratings shall be in accordance with ARI Standard 360 "Standard for Commercial and Industrial Unitary Air-Conditioning Equipment" and all other ARI standards applicable.
 - 2. Refrigeration system shall be constructed in accordance with ASHRAE Standard ASHRAE 15 "Safety Code for Mechanical Refrigeration".
 - 3. Air cooled Condensers shall meet or exceed the minimum COP/Efficiency levels as prescribed in ASHRAE 90A "Energy Conservation in New Building Design".
 - 4. Air cooled Condensers shall be listed by UL and have UL label affixed.
 - 5. Unit construction shall comply with ANSI safety code.
 - 6. Unit construction shall comply with the National Electrical Code.
- 1.5 DELIVERY, STORAGE, AND HANDLING:
- A. Follow manufacturer's written instructions for rigging.
- 1.6 SEQUENCING AND SCHEDULING:
- A. Coordinate layout, of roof mounted equipment supports and roof penetrations for roof-mounted units.
 - B. Coordinate size and location at concrete equipment bases for ground mounted units.
 - C. Coordinate rough-in of refrigerant piping and electrical service.

1.7 SPECIAL PROJECT WARRANTY:

- A. Warranty on Motor/Compressor: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, motors/compressors with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. Replacement is limited to component replacement only, and does not include labor for removal and reinstallation.
1. Warranty Period: 5 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
1. Air Cooled Condensers :
 - a. McQuay Air Conditioning Group; McQuay Inc.
 - b. Trane (The) Co; Div American Standard Inc.
 - c. York; Div of York International.
- B. General: factory-assembled and tested, air cooled condensers, consisting of casing, condensers coils, condenser fans and motors, and unit controls. Capacities and electrical characteristics are scheduled at the end of this Section.
- C. Unit Casings: designed for outdoor installation and complete with weather protection for components and controls, and complete with removable panels for required access to controls, condenser fans, motors, and drives. Additional features include:
1. Steel, galvanized or zinc-coated, for exposed casing surfaces, treated and finished with manufacturer's standard paint coating;
 2. Lifting lugs to facilitate rigging of units;
 3. Factory-installed metal grilles, for protection of condenser coil during shipping, installation, and operation;
 4. Hinged and gasketed control panel door.
 5. Roof mounted units shall be mounted on spring isolators.
- D. Controls: Operating and safety controls shall include condenser fan motors thermal and overload cutouts. Control transformer if required shall be as required by the Division 15 controls contractor. Provide magnetic contactors for condenser fan motors, and an unfused disconnect switch which is factory-mounted and wired for single external electrical power connection.
- E. Condensing Section: Condenser coil shall be seamless copper tubing mechanically bonded to heavy-duty, configured aluminum fins. Units shall include liquid accumulator and subcooling circuit, and back-seating liquid line service access valve. Condenser coils shall be factory tested at 450 psig, vacuum dehydrate, and filled with a holding charge of nitrogen. Additional features include:

1. Insulated receivers.
 2. Pressure relief valves.
 3. Head pressure control valves.
- F. Condenser fans and drives: Propeller-type condenser fans for vertical air discharge; either direct drive or belt drive. Additional features include:
1. Permanent lubricated ball bearing condenser fan motors;
 2. Separate motor for each condenser fan;
 3. Constant speed condenser fan motors;
 4. Each fan assembly dynamically and statically balanced.
- G. Low ambient head pressure control: Factory-installed low ambient damper assembly, fan speed control, or fan cycling control for operation down to -20 [] degrees F.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Verify all dimensions by field measurements. Verify that all air cooled condensers may be installed in accordance with pertinent codes and regulations, the original design, and the referenced standards.
- B. Verify roof structure, mounting supports, and membrane installations are completed to the proper point to allow installation of roof mounted units.
- C. Examine rough-in for refrigerant piping systems to verify actual locations of piping connections prior to installation.
- D. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

- A. Install air cooled condensers in accordance with manufacturers installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.
- B. Install ground-mounted units on 4" thick reinforced concrete pad, 4" larger on each side than condensing unit. Concrete, formwork, and reinforcing are specified in Division 3. Coordinate installation of anchoring devices.
- C. Install roof-mounted units on equipment supports specified in Division 7. Anchor unit to supports with removable fasteners.
- D. Install furnished field mounted accessories.

3.3 CONNECTIONS:

- A. Refrigerant piping installation requirements are specified in other sections of Division 15. The Drawings indicate the general arrangement of piping, fittings, and specialties. Install piping adjacent to machine to allow servicing and maintenance.
 1. Provide flexible connections on all piping connections.

3.4 FIELD QUALITY CONTROL:

- A. Provide the services, to include a written report, of a factory authorized service representative to examine the field assembly of the components, installation, and piping and electrical connections.
- B. Charge systems with refrigerant and oil, and test for leaks. Repair leaks and replace lost refrigerant and oil.

3.5 DEMONSTRATION:

- A. Provide the services of a factory authorized service representative to provide start-up service and to demonstrate and train the Owner's maintenance personnel as specified below.
- B. Start-up service: Place units into operation and adjust controls and safeties. Replace damaged or malfunctioning components and controls.
- C. Training:
 - 1. Schedule a minimum of 4 hours of training with Owner. The manufacturers representative, and the Division 15 contractor shall be present. The training shall be coordinated by the Division 15 contractor and the Owner in conjunction with the other mechanical equipment on the project.
 - 2. Train the Owner's maintenance personnel on start-up and shut-down procedures, troubleshooting procedures, and servicing and preventative maintenance schedules and procedures. Review with the Owner's personnel, the contents of the Operating and Maintenance Data specified in Division 1 and Section 15010.

END OF SECTION 15743