SECTION 23 81 26

SPLIT-SYSTEM AIR-CONDITIONERS

1.0 GENERAL

1. DESCRIPTION
   1. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.
   2. This Section 23 81 26 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the split systems as specified herein and as shown. This work includes, but is not limited to, the following:
      1. Split system fan coil, heating section and condensing units
      2. Control system (interlocked to all split system components)
   3. Split system units shall be self-contained, automatic, packaged units. These units shall be completely factory-assembled as unitary packages complete with operating controls, internal wiring and piping and fully charged with refrigerant. Only one electrical power connection shall be required for each unit.
   4. Units shall be UL listed and cooling capacities shall be certified in accordance with ANSI/AHRI 210/240.
2. INTENT
   1. It is the intent of this Section of the specifications to provide complete, operable, adjusted split systems, as shown and specified, which operate efficiently and automatically, and are free of excessive noise and vibration.
3. BASIS OF DESIGN
   1. The basis of design is as scheduled. Acceptable alternate manufactures include Trane, Carrier, Mitsubishi, Lennox, and Daikin for ducted systems except that Liebert systems are also acceptable for Server/IT spaces, and Carrier, Mitsubishi, LG, Hitachi, and Daikin for ductless mini-splits. Any proposed substitutions shall be submitted in accordance with the prior approval requirements.
   2. \*\*(Residential Projects) The basis of design is as scheduled. Acceptable alternate manufacturers include Goodman, Lennox, York, and Rheem for traditional systems and Fujitsu, York, Friedrich, and GE for ductless systems.

2.0 PRODUCTS

1. UNIT CASINGS
   1. Unit casings shall be formed, galvanized steel construction with welded assembly. Galvanized steel surfaces shall be bonderized and painted with baked acrylic enamel for complete weather protection. Accessories and components shall match and interlock with all other split system components. Fan coil unit casings shall be fully internally insulated with liner which meets NFPA 25/50 flame spread/smoke developed ratings.
2. CONDENSING UNITS
   1. Condensing unit refrigeration systems shall be factory-charged and ready for operation. All units with capacities greater than five (5) tons shall be provided with minimum 2-stage (50% and 100%) cooling. Compressor(s) shall be direct drive, 3600 RPM, hermetic reciprocating type with centrifugal oil pump, crankcase heater and internal pressure relief valve. Compressor(s) shall have internal spring isolation and sound muffling and exhibit minimum vibration transmission and noise. Anti-recycle timers shall be provided to prevent excessive cycling of compressors thru utilization of a minimum five (5) minute time shutdown of unit on interruption of power or controlled shutdown.
   2. Condensing unit condenser fans shall be direct-driven, propeller blade type. Condensing unit heat rejection shall be vertically upward.
3. COILS
   1. Evaporator and condenser coils shall be copper tubing mechanically bonded to heavy duty aluminum fins. Aluminum tubes shall not be acceptable.
4. \*\*ELECTRIC HEATING SECTIONS
   1. Electric heating sections shall be UL listed with nickel-chromium open coil resistance heating elements. Each heater shall be protected by an automatic reset high-limit thermostat and manual reset high-limit thermostat for the primary and secondary overcurrent/thermal protection. A proof of airflow/fan interlock shall also be provided. Controls shall provide for multiple stage start-up and operation.
5. \*\*GAS HEATING SECTIONS\*\*5 TONS OR LESS
   1. Gas heating sections shall be factory-mounted as an integral part of the fan coil units. They shall be certified by AGA for use on natural gas.
   2. Heat exchanger shall be located upstream of the cooling coil and shall be fabricated from stainless or aluminized steel, stress-relieved and free-floating.
   3. The unit shall utilize an electronic, spark-ignition pilot light; not a standing pilot.
6. \*\*GAS HEATING SECTION\*\*LARGER THAN 5 TONS
   1. Gas heating sections shall be mounted separate from the fan coil unit and shall be located downstream of the fan coil unit. They shall be AGA certified for use on natural gas.
   2. The heat exchanger shall be constructed of Type 409 stainless steel with all seams welded.
   3. The gas train shall be suitable for gas pressures of up to 14" WC and shall provide two (2) stages of heat. Ignition shall occur in low fire (50% of input).
   4. The gas heating section shall utilize an electronic, spark-ignition pilot light; not a standing pilot.
7. CONTROLS AND ACCESSORIES
   1. All operating and safety controls which are internal to each unit shall be factory-installed and shall include, as a minimum, solid state compressor overload protection, magnetic contactors, thermostatic expansion valve(s), refrigerant line drier(s), outdoor fan and compressor cycling thermostats, high and low limit protection against excessive temperatures or pressures.
   2. A 24 volt transformer shall be provided to accommodate an accessory 24 volt indoor thermostat complete with an electronic programmable night setback, separate automatic heat/cool settings, auto/manual fan control and seasonal selector. Thermostat shall provide staging of the cooling and heating to match the stages of each component.
   3. \*\*Provide a locking cover for each indoor thermostat.
   4. \*\*Controls on electric heat section shall meet NEMA specifications and requirements.
   5. \*\*Controls on gas heating sections shall be AGA certified.
   6. Automatic shutdown controls shall be provided on units ≥2,000 CFM to meet local Codes (or NFPA 90A as a minimum) and shall consist of firestats and duct-mounted smoke detectors interlocked to the fan coil unit for shutdown on the detection of fire or smoke.
   7. Provide with integral refrigerant leak detector. Upon detection, fan shall be fully enabled.
8. FILTERS
   1. \*\*Units shall have minimum 1 inch thick, low velocity, glass fiber throwaway filters in commercially available sizes.

3.0 EXECUTION

1. INSTALLATION
   1. The split systems and associated controls shall be installed in strict accordance with the manufacturer's recommendations.
   2. The control system shall be completely wired under this Division 23. Wiring shall be in accordance with the NEC and shall meet all requirements for this installation.
2. STARTUP
   1. Provide the services of a factory-trained and qualified Service Technician employed by the Unit Manufacturer who shall inspect the installation including external interlock and power connections; supervise leak testing, initial operation, calibration of operating and safety controls and supervise electrical testing including insulation resistance of motors and voltage balance between phases during starting and running.
   2. This Service Technician shall forward a report in four (4) copies to the Owner when the unit is in safe and proper operating condition. This report shall include all pressure and control settings, meg readings, voltage readings per phase during start and run, and shall list minor discrepancies to be corrected that affect safe and reliable operation. One additional copy of the report shall be left in the unit control panel. One copy of bound installation, operation, maintenance service and parts brochures, including applicable serial numbers, full unit description and parts ordering sources, shall be placed in the unit control panel at the time of startup; four (4) additional copies shall be forwarded to the Owner.

END OF SECTION