SECTION 23 82 39

CONVECTION UNIT HEATERS

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 82 39 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the unit heaters as specified herein and as shown. This work includes, but is not limited to, the following:
      1. Gas-fired unit heaters and accessories
      2. Electric unit heaters and accessories
      3. Control system (interlocked to the units)
2. INTENT
   1. It is the intent of this Section of the specifications to provide complete, operable, adjusted unit heaters, as shown and specified, which are suitable for operation on natural gas.
3. BASIS OF DESIGN
   1. The basis of design for the gas-fired unit heater is as scheduled. Acceptable substitute manufacturers are Reznor, Sterling, Berko, and Hastings. Any proposed substitutions or equals by other manufacturers shall be proven equal in all respects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.
   2. The basis of design for the electric unit heater is as scheduled. Acceptable substitute manufacturers are QMark, Berko, Markel, Redd-I, Indeeco, Chromalox, and Trane. Any proposed substitutions or equals by other manufacturers shall be proven equal in all respects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.

2.0 PRODUCTS

1. COMPONENTS
   1. Gas-fired unit heaters shall be complete with the following:
      1. Aluminized steel heat exchanger as applicable
      2. Fan and limit safety controls
      3. 24-volt control voltage transformer
      4. Terminal strip connector for 24-volt field wiring
      5. Single-stage combination gas valve
      6. Electronic, intermittent pilot with spark ignition
      7. Bottom burner access as applicable
      8. Full safety fan guard
      9. Thermostat
      10. Horizontal directional louvers
      11. Vent outlet with Type B flue through roof, as applicable, UON
      12. Threaded hanger connections and mounting brackets
      13. Baked enamel steel finish
      14. Disconnect
      15. Blocked vent shut-off system/safety
      16. Step-down transformer 460/1 to 115/1
   2. Electric unit heaters shall be complete with the following:
      1. 24-volt control voltage transformer
      2. Full safety fan guard
      3. Horizontal directional louvers
      4. Threaded hanger connections and mounting brackets
      5. Baked enamel steel finish
      6. Integral thermostat UON
      7. Disconnect
   3. In addition, electric unit heaters shall have:
      1. Heaters shall consist of individually mounted heating elements mounted in a sheet metal housing. Individual heating elements shall be of open coil construction.
      2. Individual heating elements shall be interconnected and wired into a junction box mounted on the unit's sheet metal housing. Terminal blocks shall be used for all terminations within the junction box. Three phase electric heaters shall consist of equally rated heater elements internally connected to provide a balanced three phase load.
      3. Each electric heater shall be provided with a factory installed UL listed automatic reset high temperature limit switch plus a factory installed UL listed manual reset high temperature limit switch.
      4. Each electric heater shall contain a factory installed pressure type air flow switch or fan interlock relay which shall prevent heater control circuits from becoming energized until air flow across the heater coils has been established. Paddle type air switch is not acceptable.
      5. Each electric heater or separately controlled section of electric heat shall be controlled by a heating contactor factory mounted within the electric heater terminal box. Contactor shall be UL listed for 100,000 cycles use with resistance heating loads. Control coil contactor shall be operated by the automatic temperature control device in series with the automatic reset high temperature limit switches.
      6. Each electric heater or separately controlled section of the electric heater shall be provided with fused circuit protection as an integral part of the duct heater. Fuses shall be dual element type and shall be rated by the electric heater manufacturer based on the enclosure temperature. A fuse shall be provided in each under grounded conductor.
      7. All electric heaters over 8.0 kW shall be staged in increments not exceeding 8.0 kW.
2. CONTROLS
   1. System shall be complete with unit low voltage thermostat. Mount to unit or as indicated on the plans.
3. SYSTEM PERFORMANCE
   1. Gas-fired unit heater system steady state efficiency shall be a minimum of 80 percent.

3.0 EXECUTION

1. INSTALLATION
   1. Installation shall be complete with all piping, flues, wiring, hangers, controls, etc. as applicable.
   2. Heaters shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.
   3. Height and exact location of unit heaters shall be as directed by the Architect UON.
   4. Thermostat locations shall be as directed by Architect.
   5. The heaters shall be tested and adjusted after installation to provide the capacities indicated.

END OF SECTION