SECTION 23 54 00 - FURNACES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with NFPA 70.
B. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

2.02 GAS FIRED FURNACES

A. Annual Fuel Utilization Efficiency (AFUE): 0.95 (“condensing”).
B. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, humidifier, and accessories; wired for single power connection with control transformer.
   1. Safety certified by CSA in accordance with ANSI Z21.47.
C. Performance:
   D. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner. If not certified for combustible flooring, please provide additional steel base.
E. Primary Heat Exchanger:
   2. Shape: Tubular type.

F. Secondary Heat Exchanger:
   2. Shape: [________].

G. Gas Burner:
   1. Atmospheric type with adjustable combustion air supply.
   2. Gas valve, two stage provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
   3. Electronic pilot ignition, with electric spark igniter.
   4. Combustion air damper with synchronous spring return damper motor.
   5. Non-corrosive combustion air blower with permanently lubricated motor.

H. Gas Burner Safety Controls:
   1. Thermocouple sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
   2. Flame rollout switch: Installed on burner box and prevents operation.
   3. Vent safety shutoff sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
   4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.

I. Supply Fan: Centrifugal type rubber mounted with direct drive with adjustable variable pitch motor pulley.

J. Motor:
   1. 1750 rpm single-speed, permanently lubricated, hinge mounted.

K. Air Filters: 1 inch (25 mm) thick urethane, washable type arranged for easy replacement.

L. Operating Controls:
   1. Room Thermostat: Cycles burner to maintain room temperature setting.
   2. Supply Fan Control: Energize from bonnet temperature independent of burner controls, with adjustable timed off delay and fixed timed on delay, with manual
switch for continuous fan operation. Provide continuous low speed fan operation.

2.03 ELECTRIC FURNACES

A. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, humidifier, and accessories; wired for single power connection with control transformer.

B. Cabinet: Steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation and reflective liner.

C. Supply Fan: Centrifugal type rubber mounted with direct drive motor.

D. Motor:
   1. 1750 rpm single-speed, permanently lubricated, hinge mounted.

E. Electric Heater: Helix wound bare nichrome wire heating elements arranged in incremental states of 5 kW each, with porcelain insulators.

F. Electric Heater Operating Controls:
   1. Low voltage adjustable room thermostat energized heater stages in sequence with pre-determined delay between heating stages.
   2. High limit temperature control de-energizes heating elements, automatic resets.

G. Air Filters: 1 inch (25 mm) thick urethane, washable type arranged for easy replacement.

H. Performance:

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer’s instructions and requirements of authorities having jurisdiction.

B. Install in accordance with NFPA 90A.

C. Install gas fired furnaces in accordance with NFPA 54.

D. Provide vent connections in accordance with NFPA 211.