
Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 23 05 00 – Common work results for HVAC.
- .2 Section 23 05 49.01 – Seismic protection systems.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .2 ASTM C916, Standard Specification for Adhesives for Duct Thermal Insulation.
 - .3 ASTM C1071, Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- .2 National Fire Protection Association (NFPA)
 - .1 NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.
 - .2 NFPA 90B, Standard for the Installation of Warm Air Heating and Air Conditioning Systems (ANSI).
- .3 Underwriters' Laboratories (UL) Inc.
 - .1 UL 2021, Fixed and Location-Dedicated Electric Room Heaters.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for unit heaters and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence and cleaning procedures.
- .4 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Canada, member of OIQ.
 - .2 Indicate on drawings:
 - .1 Equipment, capacity and piping connections.
 - .2 Dimensions, internal and external construction details, recommended method of installation with proposed support, sizes and location of mounting bolt holes.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for unit heaters for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect unit heaters from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 MATERIAL/PRODUCT REPLACEMENT

- .1 Where materials or products are specified by their trademark, consult the Instructions to Bidders document for the procedures to follow regarding the request for approval for materials or product replacement.
- .2 Material/Product Replacement
 - .1 Providing material/equipment maintenance required in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Provide a list of spare parts recommended by each manufacturer, a list of suppliers where one can obtain spare parts, and a list of special tools necessary to adjust, repair and replacement of these parts, and add them in the maintenance manual.
 - .3 Provide following: one complete set of renewable evaporator media.

Part 2 Products

2.1 GAS UNIT HEATERS – DOWNFLOW DISCHARGE

- .1 General
 - .1 Certified by CSA.
- .2 Cabinet
 - .1 Powder-coat paint finish on G30 galvanized steel. Constructed so that screws are not visible from the bottom, front or sides.
 - .2 Service access panel with lifting handle to access all internal components.
 - .3 Aerodynamic louvers conceived such as to reduce noise level.
 - .4 Low static pressure axial fan. Fan and drive guard.

- .3 Heat exchanger
 - .1 Tubes made of titanium stabilized alumized steel. Fabricated with no welding, only tool pressed mechanical joints.
 - .2 Multi-cell 4 pass serpentine style heat exchanger with 83% thermal efficiency.
 - .3 10-year warranty.
- .4 Burner
 - .1 Cell type burner, auto-aligning, for air-gas premix and with multiple combustion surfaces.
 - .2 Venturi tube and orifice calibrated for all heat exchangers.
 - .3 Combustion collector with radial blade fan to exhaust combustion gases, with integral flow switch.
 - .4 Controls and fuel train for natural gas and incorporated into service cabinet of unit.
 - .5 Forced-flow burner.
 - .6 10-year warranty.
- .5 Controls :
 - .1 Single-stage gas valve and safety limit switch.
 - .2 120/24 volts stepdown transformer.
 - .3 Direct spark ignition automatically controlled via a printed circuit control board with two diagnostic lights. The first light is for safety faults and the second light is for the state and quality of the flame.
 - .4 All controls are prewired and ready for connection of 24 volts thermostat to externally mounted terminal connector.
- .6 Accessories : vent cap
- .7 Capacity : see tables in drawings.
- .8 Acceptable products : Reznor UDAP or a replacement product approved via addenda in accordance with Bidder instructions.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for unit heaters installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Check final location with Departmental Representative if different from that indicated prior to installation.
 - .1 Should deviations beyond allowable clearances arise, request and follow Departmental Representative's directive.
- .3 Gas unit heaters: for each unit, install isolation gate valves on piping.
- .4 Clean finned tubes and comb straight.
- .5 Provide supplementary suspension steel as required.
- .6 Install thermostats in locations indicated.
- .7 Before acceptance, set discharge patterns and fan speeds to suit requirements.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by unit heaters installation.

END OF SECTION