SECTION 23 74 33
PACKAGED OUTDOOR HEATING AND COOLING MAKE-UP AIR UNIT

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.

B. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.

C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 54 - National Fuel Gas Code; 2024.

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

F. NFPA 70B - Recommended Practice for Electrical Equipment Maintenance; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

H. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.02 THE CONTRACTOR IS REFERRED TO THE “SPECIAL NOTICE TO CONTRACTORS SUMMARY FORM “THE “FORM OF PROPOSAL”; THE “FORM OF BID BOND”; “DIVISION 01 – GENERAL REQUIREMENTS” OF THE “CONTRACT SPECIFICATIONS”; THE “CONTRACT DRAWINGS” AND ALL AMENDMENTS AND ADDENDA THERETO; ALL OF WHICH GOVERN THE WORK OF THIS SECTION.

A. 1.01 SECTION INCLUDES
   1. A. Indirect Fired Gas Heating and Electric Cooling make-up air unit.
   2. B. Controls.

B. 1.02 RELATED REQUIREMENTS
   1. A. Section 23 05 13 - Common Motor Requirements for HVAC Equipment.
   2. B. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.
   3. C. Section 23 09 13 - Instrumentation and Control Devices for HVAC: Control components, time clocks.
   4. D. Section 23 33 00 - Air Duct Accessories: Flexible duct connections.
   5. E. Section 23 34 16 - Centrifugal HVAC Fans: Supply fans.
   6. F. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

C. 1.03 REFERENCE STANDARDS
   1. A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008, Including All Addenda.
   2. B. AHRI 270 - Sound Performance Rating of Outdoor Unitary Equipment; 2015.
   3. C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; 2013, Including All Amendments and Errata.
   4. D. NFPA 54 - National Fuel Gas Code; 2015.
   5. E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   6. F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

D. 1.04 SUBMITTALS
   1. A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

2. B. Product Data: Provide data with dimensions, duct and service connections, accessories, controls, electrical nameplate data, and wiring diagrams.
3. C. Shop Drawings: Indicate dimensions, duct and service connections, accessories, controls, electrical nameplate data, and wiring diagrams.
4. D. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.
5. E. Operation And Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
6. F. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
7. G. Project Record Documents: Record actual locations of components.
8. H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    a. 1. Extra Filters: One set of each type and size.

E. 1.05 QUALITY ASSURANCE
1. A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

F. 1.06 REGULATORY REQUIREMENTS
1. A. Conform to NFPA 70B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

G. 1.07 WARRANTY
1. A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
2. B. Provide five year manufacturers warranty for compressor/condenser unit.

PART 2 PRODUCTS

2.01 2.01 MANUFACTURERS
1. A. Greenheck: www.greenheck.com.
2. B. I.C.E. (Industrial Commercial Equipment Manufacturing Ltd.): www.ice-ww.com.
3. C. Applied Air/Mestek Technology, Inc: www.appliedair.com.
4. D. CaptiveAire.
5. E. Approved Equal

B. 2.02 MANUFACTURED UNITS
1. A. Unit: Outdoor unit.
    a. 1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207. Testing: ASHRAE Std 23.1.
    b. 2. Performance Ratings: Energy Efficiency Rating (EER)/Coefficient of Performance (COP) not less than requirements of ASHRAE Std 90.1 I-P.
    c. 3. Heating Capacity:
        1) a. Delivery temperature: As noted on Drawing.
        2) b. Temperature rise: As noted on Drawing.
        3) c. Air Flow: As noted on Drawing.
        4) d. External static pressure: As noted on Drawing.

4. COOLING CAPACITY:
        1) a. Delivery temperature: As noted on Drawing.
        2) b. Temperature drop: As noted on Drawing.
        3) c. Air Flow: As noted on Drawing.
        4) d. External static pressure: As noted on Drawing.

B. 2.03 FABRICATION
1. A. Casing and Components: Steel panels, 18 gage, 0.0478 reinforced with structural angles and channels to ensure rigidity; access panels to burner and blower motor assemblies from either side of unit.
2. C. Insulation: Neoprene faced glass fiber insulation 1 inch thick.

3. D. Finish: Heat resistant baked enamel.
4. E. Outdoor Installation: Weatherproofed casing, with intake louver or hood.

C. 2.04 FILTERS
1. A. Filter: Removable 2 inch thick high velocity permanent filters in metal frames.

D. 2.05 FAN
1. A. Fan: Statically and dynamically balanced centrifugal fan mounted on solid steel shaft with heavy duty self-aligning pre-lubricated ball bearings and V-belt drive with matching motor sheaves and belts.
2. B. Electrical Characteristics: As specified on the drawing.
3. C. Motor: Refer to Section 23 0513.

2.06 INLET DAMPERS

a. Manufacturer shall provide and install on unit, a two position, motor operated damper with internal end switch to energize the blower-starter circuit, after damper is proven open. Blades shall be 16 gauge G-90 galvanized steel. Damper blades to be mounted on friction-free synthetic bearings.

2.07 COOLING EQUIPMENT

a. All cooling equipment shall conform local code requirements. All gas manifold components shall be piped and wired at the factory.
b. Components include:
c. Condenser with minimum SEER to comply with NYC Energy Coservation Code.
d. Thermal expansion Valve
e. Filter/Dryer
f. Hard Start Kit for Condenser
g. Insulated suction lines
h. Multiple stages where required.
i. Pre-charged system
j. R-410A Refrigerant

2.08 GAS EQUIPMENT

a. All gas equipment shall conform to local code requirements. Allgas manifold components shall be piped and wired at the factory.
b. Components include:
c. Modulating gas valve
d. On/off redundant gas valve
e. Burner
f. Main-gas shut-off valve
g. Main gas regulator
h. Two solenoid valves

B. 2.07 CONTROLS
1. A. Controls: Pre-wire unit for connection of power supply. Field wiring from unit to remote control panel makes unit operative.
2. B. Remote Control Panel: On-off-auto switch, indicating lights for supply fan, pilot operation, burner operation, lockout indication, and clogged filter indication, SUMMER/OFF/WINTER Selector Switch,
3. C. Interlocks: Unit to start when kitchen hood exhaust fan is running. Burner to operate when flow switch located in exhaust duct proves flow. Unit shall shut down upon activation of the Fire Suppression System and reset manually.
4. D. Fan Discharge Thermostat: Controls modulating gas valve to maintain supply air temperature.
5. E. Safety Controls: Sense correct air flow before energizing pilot and sense pilot ignition before activating main gas valve.
6. F. Manual Reset Low and High Limit Controls: Maintain supply air temperature between set points and shut fan down if temperatures are exceeded.

7. G. Purge Period Timer: Automatically delays burner ignition and bypass low limit control.
8. H. An adjustable dial controller with an internal thermostat for set-point adjustment to maintain room temperature.

PART 3 EXECUTION

7.01 3.01 INSTALLATION

1. A. Install in accordance with manufacturer's instructions.
2. B. Install to NFPA 90A.
3. C. Provide flexible duct connections on outlet from unit; refer to Section 23 3300.

B. 3.02 MAINTENANCE

1. A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
2. B. Provide service and maintenance of units for one year from Date of Substantial Completion.

C. 3.03 SCHEDULES

1. A. Make-UP Air Units Schedule.
2. B. Location:
3. C. Performance-As noted on Drawing

END OF SECTION 23 74 33