

SECTION 23 8126 – DUCT FREE SPLIT SYSTEM AIR CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes split-system air-conditioning units consisting of separate evaporator-fan and compressor-condenser components.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Operation and maintenance data.
- C. Warranty

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance:
  - 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
  - 2. Applicable requirements in ASHRAE 62.1-2010, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-Up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2010.

1.4 WARRANTY

- A. One (1) year manufacturer's warranty, provide an additional four (4) year warranty on all compressors (5 years total).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. Carrier

2. Mitsubishi Electric

## 2.2 GENERAL

### A. Description:

1. Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air horizontally as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.
2. Indoor, direct-expansion, wall-mounted fan coil. Unit shall be complete with cooling coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and integral temperature sensing. Unit shall be furnished with integral wall mounting bracket and mounting hardware.

### B. Refrigeration Components:

1. Refrigeration circuit components will include liquid-line front-seating shutoff valve with sweat connections, vapor-line front-seating shutoff valve with sweat connections, system charge of R-410A refrigerant, and compressor oil. Unit will be equipped with high-pressure switch, low pressure switch and filter drier for R-410A refrigerant.

## 2.3 INDOOR WALL-MOUNTED DUCT FREE UNIT (SAHU-1)

### A. Unit Cabinet

1. Cabinet discharge and inlet grilles shall be attractively styled, high-impact polystyrene. Cabinet shall be fully insulated for improved thermal and acoustic performance.

### B. Fans

1. Fan shall be tangential direct-drive blower type with air intake at the top of the unit and discharge at the bottom front. Automatic, motor-driven vertical air sweep shall be provided standard.
2. Air sweep operation shall be user selectable. The vertical sweep may be adjusted (using the remote control) and the horizontal air direction may be set manually.

### C. Coil

1. Coil shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion.
2. A drip pan under the coil shall have two drain connections for hose attachment, on either the left or right-hand side, to remove condensate. Condensate pan shall have internal trap.

### D. Motors

1. Motors shall be open drip-proof, permanently lubricated ball bearing with inherent overload protection. Fan motors shall be 3-speed.

E. Filters

1. Unit shall have filter track with factory--supplied cleanable filters.

F. Operating Characteristics

1. SAHU-1 when matched with the appropriate outdoor section, shall have a minimum listed SEER (seasonal energy efficiency ratio) of 13 at ARI conditions.
2. All other operating characteristics as scheduled on the drawings.

2.4 OUTDOOR CONDENSING UNIT (CU-1)

A. Unit Cabinet

1. Unit cabinet shall be will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

B. Fans

1. Fan shall be direct-drive propeller type discharging air horizontally.
2. Condenser fan motors will be totally enclosed, 1—phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant.
3. Fan blades will be statically and dynamically balanced.
4. Condenser fan openings will be equipped with coated steel wire safety guards.

C. Compressor

1. Compressor will be hermetically sealed.
2. Compressor will be mounted on rubber vibration isolators.
3. Condenser coil will be air cooled.
4. Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

2.5 CONTROLS

A. Controls shall consist of a microprocessor-based control system which shall control space temperature, determine optimum speed, and run self diagnostics.

1. User interface with the unit shall be accomplished through a wired controller.

B. The unit shall have the following functions as a minimum:

1. An automatic restart after power failure at the same operating conditions as at failure.
2. A timer function to provide a minimum 24--hour timer cycle for system Auto Start/Stop.
3. Temperature--sensing controls shall sense return air temperature.
4. Indoor coil freeze protection.
5. Automatic vertical air sweep control to provide on or off activation of air sweep louvers.
6. Dehumidification mode shall provide increased latent removal capability by modulating system operation and set point temperature.
7. Fan--only operation to provide room air circulation when no cooling is required.
8. Diagnostics shall provide continuous checks of unit operation and warn of possible malfunctions. Error messages shall be displayed at the unit.

9. Fan speed control shall be user--selectable: high, medium, low, or microprocessor controlled automatic operation during all operating modes.

2.6 OPTIONAL FEATURES:

- A. Provide Low Ambient Kit: Control shall regulate fan--motor cycles in response to saturated condensing temperature of the unit. The control shall be capable of maintaining a condensing temperature of 100 F  $\pm$  10 F with outdoor temperatures to -20 F
- B. Provide crankcase heater
- C. Provide wind baffle

2.7 ELECTRICAL REQUIREMENTS:

- A. Unit shall operate on the voltage shown on drawings.
- B. Only control wiring shall run between the indoor and outdoor units.
- C. Indoor and Outdoor unit electrical power shall be single point connection.
- D. Voltage as scheduled on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Condenser shall be installed in strict accordance with the manufacturer's printed instructions.
- B. Install units level and plumb.
- C. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- D. Install compressor-condenser components on equipment supports specified in Division 07. Anchor units to supports with removable, fasteners.
- E. Test, dehydrate, and charge the refrigeration system in strict accordance with the manufacturer's instructions.
- F. Insulate both refrigerant lines.

3.2 CONNECTIONS

- A. For Refrigerant Piping Refer to Section 232300

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

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1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.
- 3.4 DEMONSTRATION
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

**END OF SECTION 23 8126**

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