

**SECTION 23 81 00
UNITARY HVAC EQUIPMENT**

PART 1 - GENERAL

1.4 SUBMITTALS

- A. Manufacturer's literature and data:
 - 1. Submit design information showing the adequacy of the unit for the local climate and the building size, configuration and level of insulation for unit noted below:
 - a. Split systems- SEER 14 or higher
 - 2. Unit Dimensions required clearances, operating weights accessories and start-up instructions.
 - 3. Electrical requirements, wiring diagrams, interlocking and control wiring showing factory installed and portions to be field installed.
- B. Certification: Submit proof of specified AHRI Certification.
- C. Performance Rating: Submit catalog selection data showing equipment ratings and compliance with required sensible-to-heat-ratio, seasonal energy efficiency ratio (SEER), and coefficient of performance (COP).

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Air-Conditioning, Heating and Refrigeration Institute (AHRI):
 - 210/240-2008.....Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment
 - 270-08.....Sound Rating of Outdoor Unitary Equipment
 - 310/380-2004.....Standard for Packaged Terminal Air-Conditioners and Heat Pumps (CSA-C744-04)
 - 340/360-2007.....Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment
- C. Air Movement and Control Association (AMCA):
 - 210-2007.....Laboratory Methods of Testing Fans for Aerodynamic Performance Rating (ANSI)
- D. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE):
 - 2008 Handbook.....HVAC Systems and Equipment
 - 15-2010.....Safety Standard for Refrigeration Systems (ANSI)
- E. American Society of Testing and Materials (ASTM):
 - B117-09.....Standard Practice for Operating Salt Spray (Fog) Apparatus
- F. National Electrical Manufacturer's Association (NEMA):

MG 1-2009.....Motors and Generators (ANSI)

G. National Fire Protection Association (NFPA) Publications:

90A-2009.....Standard for the Installation of Air-
Conditioning and Ventilating Systems

PART 2 - PRODUCTS

2.1 SPLIT-SYSTEM AIR HANDLING UNIT

A. Description: Factory assembled and tested air handling unit.

B. Air Handling Unit Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Factory-applied.
3. Drain Pans: Galvanized steel, with connection for drain; insulated and complying with ASHRAE 62.1-2007.
4. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.
5. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with AHRI 210/240, and with thermal-expansion valve.
6. Electric-Resistance Heating Coil: Helical, nickel-chrome, resistance-wire heating elements with refractory ceramic support bushings; automatic-reset thermal cutout; built-in magnetic contactors; manual-reset thermal cutout; airflow proving device; and one-time fuses in terminal box for overcurrent protection.
7. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
8. Fan Motors: Multi-tapped, multi-speed motors with internal thermal protection and permanent lubrication.
9. Disposable Filters: 25 mm (1 inch) thick, in fiberboard frames with MERV rating of 8 or higher according to ASHRAE 52.2.
10. Wiring Terminations: Connect motor to chassis wiring with plug connection.

C. Air Cooled Condenser:

1. Casing: Steel, finished with baked enamel, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Service valves, fittings, and gage ports shall be brass and located outside of the casing.
2. Compressor: Hermetically sealed scroll compressor with crankcase heater and mounted on vibration isolation. Compressor motor shall have thermal and current sensitive overload devices, start capacitor, relay, and contactor.
3. Refrigerant: R-407C or R-410A as required by the manufacturer.

4. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with AHRI 210/240, and with liquid subcooler.
5. Heat Pump Components: Reversing valve and low-temperature-air cut-off thermostat.
6. Fan: Aluminum, propeller type, directly connected to motor.
7. Motor: Permanently lubricated, with integral thermal-overload protection.
8. Low Ambient Kit: Permit operation down to -13 deg F.
9. Mounting Base: Polyethylene.
10. Minimum Energy Efficiency: Comply with ASHRAE/IESNA 90.1-2007, "Energy Standard for Buildings except Low-Rise Residential Buildings."

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb maintaining manufacturer's recommended clearances and tolerances.
- B. Install ground-mounting, compressor-condenser components on polyethylene mounting base.
- C. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.
- D. Install wall sleeves in finished wall assembly and weatherproof.

3.2 CONNECTIONS

- A. Verify condensate drainage requirements.
- B. Install condensate drain, minimum connection size, with trap and indirect connection to nearest floor drain.
- C. Install piping adjacent to units to allow service and maintenance.
- D. Ground equipment and install power wiring, switches, and controls for self contained and split systems.
- E. Connect refrigerant piping to coils with shutoff valves on the suction and liquid lines at the coil and a union or flange at each connection at the coil and condenser.

3.3 FIELD QUALITY CONTROL

- A. Tests and Inspections: After installing units and after electrical circuitry has been energized, test units for compliance with requirements. Inspect for and remove shipping bolts, blocks, and tie-down straps. After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Remove and replace malfunctioning units and retest as specified above.

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