A-A-50502
November 29, 1990

COMMERCIAL ITEM DESCRIPTION

AIR CONDITIONER, (UNITARY HEAT PUMP), AIR TO AIR (3,000 TO 300,000 BTU)

The General Services Administration has authorized the use of this Commercial Item Description (CID) in preference to Type I, Type II, Class A, Size 1 and 2 of Military Specification MIL-H-22547C(YD).

1. Abstract. This Commercial Item Description (CID) covers air-to-air heat pumps for use as residential, commercial, or industrial units and are designed to perform the functions of either heating or cooling, circulating, filtering, cleaning, and dehumidifying an air stream. The heating function may be supplemented by electrical resistance heaters. This CID does not apply to room air conditioning type heat pumps covered by the Association of Home Appliance Manufacturers. Types and classes are as follows:

Type I - Heat pump, factory assembled refrigerant circuit or circuits (packaged unit).
Type II - Heat pump (split-system) employing remote outdoor section separate from indoor section.

Class 1 - Department of Energy (DoE) covered products (units with cooling capacity up to 65,000 British thermal units (Btu/hr)).
Class 2 - Non-DoE covered products (units with cooling capacity up to 300,000 Btu/hr).

2. Salient characteristics.

2.1 Type I heat pump. Unless otherwise specified (see 6.1), the type I heat pump will consist of a factory assembled sheet metal enclosure complete with supply air blower, compressor motor assembly, compressor motor contactor or starter (when required), compressor motor overload protection devices, and crankcase heat. The unit will be equipped with refrigerant and fan overload protective device, control devices, changeover valve(s) and check valve(s) (when

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required), refrigerant and oil charge, and a pressure relief means. Supplemental electrical heaters will be furnished with or in the unit. Temperature limiting devices will be furnished on heat pumps with supplemental electrical heaters. A room indoor thermostat will be provided.

2.2 Type II heat pump. Unless otherwise specified (see 6.1), the type II heat pump will consist of a matched system consisting of separate outdoor and indoor sections connected with interconnecting refrigerant piping. The outdoor section will consist of an outdoor coil(s), compressor(s) complete with protective devices and crankcase heat, changeover valve(s), check valve(s) when required, fan(s), cabinet, and all control devices and accessories as specified and required for proper operation of the outdoor portion of the system. The indoor section will consist of an indoor coil, supply air blower, cabinet, provision for mounting of filter(s), and all controls and accessories as specified and required for proper operation of the indoor portion of the system. The system will be provided with oil and a factory charge of refrigerant. Supplemental electrical heaters complete with temperature limiting devices and controls will be supplied as specified (see 6.1). An outdoor thermostat will be provided integral with or remote from the outdoor unit. A room thermostat will be provided.

2.3 Standards compliance. Where applicable, all heat pumps will conform to the following:

a. Unit will be rated in accordance with Air Conditioning and Refrigeration Institute (ARI) Standards 240 or 340, and 270.
b. Unit will be designed to conform to American National Standard Institute (ANSI) B 9.1.
c. Unit will conform to applicable Underwriters Laboratories (UL) standards.
d. Roof curb will be designed to conform to National Roofing Contractors Association (NRAC) standards.
e. Insulation and adhesive will meet National Fire Protection Association (NFPA) 90A requirements for flame spread and smoke generation.

2.4 Design. The heat pumps will be designed to operate at ambient temperatures between 115 degrees Fahrenheit (°F) and 55°F in cooling mode and between 75°F and -20°F in heating mode. The heat pumps will conform to safety requirements of UL 559. The refrigerant will be ASHRAE refrigerant number R-22. Unless otherwise specified (see 6.1), air quantity and minimum external resistance will be as required in ARI 240 and ARI 340, as applicable.

2.5 Performance.

2.5.1 Heat pump cooling and heating capacity. The heat pump heating and cooling (sensible and latent) capacity will not be less than specified for the heating and cooling indoor and outdoor conditions (see 6.1). The minimum capacity for the supplemental heaters will be 80 percent of the heating load.

2.5.2 Sound rating. All outdoor unitary heat pumps will not be greater than an ARI 270 sound rating of 8.4 bels for units below 38,000 Btu/hr (11,100 watts (W)), 8.6 bels for units between 38,000 Btu/hr and 65,000 Btu/hr (19,000 W), and 8.8 bels for units between 65,000 Btu/hr and 300,000 Btu/hr (87,930 W) in rated capacity.

2.5.3 Energy performance requirement for all non-DoE rated heat pumps. The minimum Energy Efficiency Ratio (EER) for cooling will not be less than 8.0. The minimum Coefficient of Performance (COP) for high temperature heating at 47°F will not be less than 3.0.

2.5.4 Energy performance requirement for DoE rated heat pumps (through 65,000 Btu/hr, single-phase-power units). The heat pumps will have the following minimum Seasonal Energy Efficiency Ratios (SEER), and minimum Heating Seasonal Performance Factor (HSPF) in accordance with ARI 240.

2.5.4.1 Current energy performance criteria. The following criteria will apply until the National Appliance Energy Conservation Act (NAECA) criteria take effect.

	Minimum SEER	Minimum HSPF	Minimum SEER + HSPF
Type I (pkg)	8.8	5.8	15.5
Type II (split)	9.0	6.0	16.0*

*Example: Either 9.0 SEER + 7.0 HSPF = 16.0 or 10.0 SEER + 6.0 HSPF = 16.0 SEER + HSPF = 16.0 would be acceptable.

SEER + HSPF = 16.0 would not be acceptable if 10.2 SEER + 5.8 HSPF = 16.0.

2.5.4.2 NAECA criteria. The following criteria will supersede the values in 2.5.4.1 as of the NAECA effective dates.

	Minimum SEER	Minimum HSPF
Type I (pkg)	9.7 (1/1/93)	6.6 (1/1/93)
Type II (split)	10.0 (1/1/92)	6.8 (1/1/92)

2.6 Corrosion protection. Units fabricated from ferrous metals, will be treated for prevention of rust by a coating or paint system in conformance with standard commercial practice. When specified (see 6.1), units intended for installation within ten miles of the ocean or in otherwise corrosive environment, will be provided with a finish as specified in 2.6.1.

2.6.1 Outdoor units. The outdoor units will be equipped with a factory coating or paint system which has been proven capable of withstanding a minimum 500 hours salt spray fog test at a dry bulb temperature of 97±2°F per ASTM B 117 and ASTM D 1654.

2.7 Enclosures. The enclosure will be in accordance with UL 559. Mechanical features will be provided which permit rooftop, floor, ceiling, or other mounting provisions as required by the procuring activity (see 6.1). Coil guard will be provided to protect exposed outdoor coil(s) from damage.

2.7.1 Grille and duct connections. When specified (see 6.1), outlet grille(s) will be furnished. Outlet grilles will be constructed to permit adjustable directional air flow in both horizontal and vertical planes.

2.7.2 Duct adaptors. Duct openings to the outside will be provided with a screen not more than 1/2-inch mesh opening size on the weather side.

2.8 Compressor. Hermetic motor-compressor units will conform to UL 984 and UL 559. Thermal protection, current overload protection, high and low pressure protection, crankcase heat and a time delay mechanism as required for the proper operation and safety of the unit, will be provided.

2.9 Coils. Coils will be constructed of copper or aluminum tubes with copper or aluminum fins, designed, sized, and selected by the system manufacturer to achieve system capacity and efficiency performance as specified or required. Coils shall be constructed and tested in accordance with American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., (ASHRAE) 15, and rated with the system per applicable ARI standards. When specified (see 6.1), outdoor section coil for units located in a marine or otherwise corrosive environment which are constructed of dissimilar metals will be coated with a baked phenolic or vinyl coating or will be constructed with an approved means of cathodic protection to minimize galvanic corrosion.

2.10 Electrical motor and motor overload protection. Motors and motor overload protection will be suitable for the electrical characteristics specified (see 6.1). Motor starters will conform to the applicable requirements of NEMA DC 2 and NFPA 70.

2.11 Electrical heaters. Electrical heaters will conform to the requirements of UL 1096 and NFPA 70. When supplemental heating is required (see 6.1) electrical resistance heaters integral with unit, or an electrical duct heater will be provided. The heater's capacity in kilowatts (kW), number of circuits, and stages will be as recommended by manufacturer to satisfy the heating requirements of 2.5.1 and 2.12.4.

2.11.1 Electrical resistance heaters. Electrical resistance heaters will be provided integral with the unit and located downstream of the indoor coil.

2.11.2 Electrical duct heaters. Duct heaters will be of a packaged design arranged for inserting in and connecting to an air duct so the heating elements are directly in the air stream. Each duct heater will have two high limit controls to protect the elements from excess temperature in case of airflow stoppage.

2.12 Controls.

2.12.1 Defrost control. The heat pumps will include an automatic defrost cycle with suitable drain provisions.

2.12.2 Protective mechanisms, controls, and auxiliary equipment. All limit controls will conform to UL 353. Pressure relief safety devices will be in accordance with ASHRAE 15.

2.12.3 Indoor temperature control. Room thermostat will contain selection switches for HEAT-OFF-COOL and FAN-AUTO-ON. The thermostat will be designed to permit interlock with outdoor thermostat and operation of supplemental electric heating by a remotely located emergency switch. All thermostats will conform to UL 873.

2.12.4 Supplemental heat control. The electrical heater will be wired in accordance with UL 559. No single step of supplemental heating will produce a temperature rise in the discharge air greater than 40°F (4.4° Celsius (C)).

2.13 Air filters. Air filters will be replaceable or cleanable type as specified (see 6.1). Replaceable filters will not be less than 1-inch thick, and will be type I or type II, conforming to ASTM F 1040. Cleanable filters will conform to ASTM F 872.

2.14 Identification marking. Identification will be permanently and legibly marked directly on the equipment assemblies and parts or on a corrosion-resisting metal plate securely attached to the equipment assemblies and parts at the source of manufacturer. Identification will include the following:

a. Name of the organization sponsoring the completely assembled air conditioning assembly.
b. Type, model or catalog number, serial numbers, and the name of the manufacturer of compressor, controls, and motors sufficient for identification, replacement of parts, or servicing.
c. Date of manufacture, and length of warranty.
d. Starting (locked-rotor) current and running current; if alternating current, the frequency and phases; if dual voltage, a diagram for changing voltage shall be shown.
e. The refrigerant used, expressed in chemical or other descriptive terms and amount of refrigerant required.
f. Factory test pressure.
g. Location of the ventilating damper, when provided, and of the control switch and thermostat, properly marked or distinctly indicated.

3. Regulatory requirements. The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 to the maximum extent practical.

4. Quality assurance.

4.1 Contractor certification. The contractor will certify and maintain objective quality evidence that the product offered meets this CID, shall be the manufacturer's standard commercial product, and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The Government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

4.2 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within the tolerances specified using conversion tables contained in the latest revision of Federal Standard No. 376, and all other requirements of this CID are met.

If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the contracting officer to determine if the product is acceptable.

The contracting officer has the option of accepting or rejecting the product.

5. Preservation, packaging, packing, labeling, and marking. Preservation, packaging, packing, labeling, and marking shall be in accordance with the requirements of ASTM D 3951, unless otherwise specified in the contract or order.

6. Notes.

6.1 Ordering data. Acquisition document should specify the following:

a. Title, number, and date of this CID.
b. Type and class of heat pump required (see 1).
c. Type I heat pump components, if different (see 2.1).
d. Type II heat pump components, if different (see 2.2).
e. Required air quantity and minimum external resistance if different (see 2.4).
f. The required heat pump heating and cooling capacity (sensible and latent) (see 2.5.1).
g. When special paint for corrosion prevention in coastal areas is required (see 2.6).
h. When mechanical features to permit rooftop, floor, ceiling, or other mounting provisions are required (see 2.7).
i. When outlet grilles are required (see 2.7.1).
j. When coil coating or cathodic protection to minimize galvanic corrosion for outdoor section coil is required (see 2.9).
k. Electrical characteristics required (see 2.10).
l. When supplemental electrical heating is required and type of electrical heater (see 2.11).
m. Type of air filter required (see 2.13).
n. When level of preservation, packaging, packing, labeling, and marking is to be other than specified (see 5.).

6.2 Sources of documents. Copies of military documents are available from:

Standardization Documents Order Desk
Building 4D
700 Robbins Avenue
Philadelphia, PA 19111-5094

6.3 Sources for non-Government association documents.

ANSI B 9.1 is available from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

ARI 240, 270, and 340 are available from the Air Conditioning and Refrigeration Institute, 1501 Wilson Blvd., Suite 600, Arlington, VA 22209.

UL 353, 559, 873, 984, and 1096 are available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062.

ASHRAE 15 is available from the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329.

ASTM B 117, ASTM D 1654, ASTM D 3951, ASTM F 873, and ASTM F 1040 are available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

NEMA DC 2 is available from the National Electrical Manufacturers Association, 2101 "L" Street, N.W., Suite 300, Washington, DC 20037.

NFPA 70 and 90A are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NRCA standards are available from the National Roofing Contractors Association, 6250 River Road, Suite 8030, Rosemont, IL 60018.

MILITARY INTERESTS:

Custodian
Navy - YD

Review Activity

DLA - GS

User Activity

Army - CE

CIVIL AGENCY COORDINATING ACTIVITY:

VA - VOC

PREPARING ACTIVITY:

Navy YD

(Project 4120-1006)