

INCH-POUND

A-A-59501

02 July 2004

COMMERCIAL ITEM DESCRIPTION

AIR CONDITIONING UNIT, ELECTRIC DRIVEN, TRAILER MOUNTED

The General Services Administration has authorized the use of this commercial item description by all federal agencies.

1. SCOPE. This commercial item description (CID) covers a wheel-mounted, electric motor driven single-pass air conditioning unit of not less than 110 tons nominal cooling capacity (EAC110).

2. PRECEDENCE.

2.1 Precedence. The EAC110 shall comply with the requirements of this document and shall comply with the applicable requirements of ASHRAE Standard 52.2; Federal Acquisition Regulations; FED-STD 595; NFPA 70 (Class 1, Division II, Group D hazardous area); OSHA; SAE AIR 1375, SAE ARP1247, SAE ARP1801, SAE ARP5374, SAE AS8090, (Type II, Group C), SAE AS38386, SAE J447, and SAE J551 in effect at the time of manufacture, unless otherwise stated. Unless otherwise stated, this document has precedence over a referenced document. Where referenced documents may conflict in characteristic or performance, the more stringent requirement shall establish the minimum.

3. SALIENT CHARACTERISTICS.

3.1 Description. The EAC110 shall selectively operate as an air conditioning unit, a ventilation unit, or a heating unit. The EAC110 shall consist of electric motor driven; vapor cycle air conditioning system, air delivery and distribution system, and the necessary controls, wiring, piping, instrumentation, and housing with wheel-mounted fully suspended undercarriage, as specified herein. The EAC110 shall deliver not less than 600 pounds per minute (ppm) of conditioned air to military aircraft through three 12-inch diameter flexible supply air ducts. The EAC110 shall be designed; to operate in any mode continuously, to require not less than 200 hours between service maintenance, to operate not less than 2000 hours per year, and for a service life of 20 years. Major component rebuilds shall not be required more frequently than every 10,000 hours operation.

Comments, suggestions, or questions on this document should be addressed to WR-ALC/LGEC, 480 Richard Way Blvd. Suite 200, Robins AFB, GA 31098-1640 or emailed to bob.yohe@robins.af.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

A-A-59501

3.1.1 Performance. The EAC110 shall be capable of storage, and operation under the following environmental conditions:

- a. Storage temperature range from -60°F to $+165^{\circ}\text{F}$.
- b. Operating temperatures range from 0°F to $+125^{\circ}\text{F}$.
- c. Exposure to relative humidity up to 100 percent.
- d. Exposure to salt fog consistent with a seaside environment.
- e. Exposure to blowing sand and dust particles as encountered in desert areas.

3.1.1.1 Cooling. The EAC110 shall deliver not less than 1,320,000 British Thermal Units (BTU)s of cooling, as measured by air enthalpy method of SAE ARP5374, at entering ambient air conditions of 97°F dry-bulb and 85°F wet-bulb. Cooling mode shall operate between ambient conditions of $+40^{\circ}\text{F}$ and $+125^{\circ}\text{F}$. Leaving air conditions in cooling mode shall be manually resettable down to $+50^{\circ}\text{F}$. System controls shall maintain discharge temperature setting automatically, up to total system cooling capacity. Exceeding system capacity shall only cause a loss of set-point control and shall not disengage the function.

3.1.1.2 Heating. The EAC110 shall deliver not less than 750,000 BTUs of reverse cycle cooling at entering ambient conditions of 47°F . Cooling mode shall operate between ambient conditions of $+20^{\circ}\text{F}$ and $+70^{\circ}\text{F}$. Leaving air temperature shall be manually resettable up to 80°F . System controls shall maintain discharge temperature setting automatically, up to total system heating capacity. Exceeding system capacity shall only cause a loss of set-point control, and shall not disengage the function.

3.2 Standard commercial product. The EAC110 shall, as a minimum, be in accordance with the requirements of this CID and shall be the manufacturer's standard commercial product. Additional or better features, not specifically prohibited by this CID, but which are a part of the manufacturer's standard commercial product, shall be included in the air conditioner furnished.

3.3 Interchangeability. All delivered EAC110 units shall be identical to the extent necessary to ensure interchangeability of component parts.

3.4 Electric power requirements. The EAC110 shall operate on 480 V, 3 phase, 60 Hz power. A 100-foot flexible insulated power cable (three conductor with ground) shall be provided with the EAC110. The cable shall be attached to a power distribution box within the EAC110, shall store within the housing, and shall be unterminated at the free end. All power from the distribution box shall be circuit protected from overload. Electric motors shall be time delay over-current protected. Electric motor starting shall be across the line for motors of 20 h.p. or less, and reduced voltage for motors exceeding 20 h.p. Power shall be transformed to reduced voltage for operation of all systems controls and instruments.

A-A-59501

3.5 Reversible vapor-cycle system. The EAC110 vapor-cycle system shall operate on a single phase refrigerant that is neither a Class I or Class II Ozone Depleting Substance/Compound (ODS/ODC). The EAC110 reversible vapor-cycle system shall include compressor(s), condenser and evaporator coil(s), ambient air fan(s), expansion valve(s) and operational controls. The compressor manufacturer shall coordinate on the system configuration and the engagement method. The compressor shall not be a piston type design. Motor driven components shall be vibration isolated from the housing and connected systems. Controls shall maintain discharge air quality below saturation and shall maintain temperature within $\pm 3^{\circ}$ F from the set-point, while operating within total system design capacity. Coil defrost shall be automatically controlled. Controls shall isolate at least 95% of the system refrigerant during normal shut-down sequence. Should the vapor-cycle system be shutdown by a safety device or emergency action, upon re-establishment of power, the controls shall start and complete a normal shut-down sequence prior to re-starting vapor-cycle operation in accordance with controls settings. Safety features shall shut down the system, if any set-point limit for temperatures, fluid levels, flows, or pressures are exceeded.

3.6 Air delivery and distribution system. The air delivery system design point shall be 600 ppm at an external static pressure of not less than 40 inches water column. Total air delivery volume shall be adjustable between 300 and 700 ppm. Air shall be routed through three 12-inch discharge outlets with individual duct volume controls. Discharge outlets shall include mating connections for attachment of 12-inch female air duct hose connectors in accordance with SAE AS38386/2. Discharge outlets shall have female style lock-on metal caps, retained to the housing with chains or cables. Volume controls shall include a lockable fine adjustment feature. Total flow and individual duct flow shall be adjustable and monitored from the control panel. The air intake shall incorporate a serviceable filter media certified to meet ASHRAE Standard 52.2, with a Minimum Efficiency Reporting Value of 13, or a dust spot efficiency of 80 percent. The filter shall be serviceable through either an access door or through the intake air grille. A gauge on the control panel (see 3.8.1) shall show filter restriction and shall identify the service requirement point.

3.6.1 Air delivery ducts and adapters. The EAC110 shall be equipped with six (6) twelve inch diameter by 25 foot insulated flexible duct assemblies in accordance with SAE AS38386. Each duct assembly shall include one 12-inch diameter male and one 12-inch diameter female connection in accordance with SAE AS 38386. The EAC110 shall be equipped with three reducing duct adapters, having one 12-inch diameter female end connector in accordance SAE AS38386/2 and one 8-inch diameter male end in accordance with MS33562.

3.7 Housing. A housing shall enclose the vapor cycle system, and the air delivery and distribution system. The housing shall provide a weather-resistant enclosure for all components. Hinged doors shall provide protection for the air intake(s), air discharge(s), ambient air coil(s), ambient air fan(s), and the control panel. Hinged doors or hinged access panels shall be provide for operational inspection and servicing. All major components shall be replaceable through either the service access doors or through removable panels specifically provided for the purpose.

A-A-59501

All air openings shall be protected from bird and plant matter infiltration by a rigid mesh. Condenser coil intake air shall be protected from dust and dirt particle build-up. Conditioned air intake(s) shall not pull design conditions rainfall into the air delivery system. Conditioned air discharge connections shall have removable caps, secured by a cable or chain.

3.7.1 Duct storage compartment. The housing shall include weather-resistant compartment(s) for the storage of six 12-inch diameter duct assemblies and three duct adapters (see 3.6.1). All ducts and adapters shall be accessible while standing on the ground without the use of a reach-extending device.

3.8 Piping and instrumentation. All systems piping materials and controls components shall be selected for the applications and pressures consistent with applicable law, published commercial guidelines, and safety factors. All piping shall be secured to structure to prevent chaffing and vibration during any mode of operation or mobility. Switches, controls, and gauges specified in 3.8.1 shall be of a type recommended by the manufacturer for the application.

3.8.1 Operator's control panel. An operators control panel shall be located on the side of the EAC110. The control panel shall be fully illuminated for night servicing operations. All components on the panel shall be weather proof. The panel shall contain as a minimum the following components:

- a. Switch, mode selector (cooling-ventilation-heating)
- b. Gauge, ambient air filter restriction (see 3.6)
- c. Gauge, discharge air temperature
- d. Gauge, discharge air pressure
- e. Gauges, total air-flow rate and (3) individual discharge outlet air flow rates
- f. Controller, total discharge air-flow
- g. Controller, (3) individual discharge duct air-flow
- h. Controller, cooling mode discharge temperature
- i. Controller, heating mode discharge temperature

3.9 Undercarriage. The EAC110 undercarriage shall be separately mounted to or integral with the housing (see 3.7). The undercarriage shall be of a two or three axle design, including; hinged towbar with lunette-coupler; suspended axles; defense department standardized wheels fitted with transport type pneumatic tires; inertia brakes; manually applied parking brakes; and lighting in accordance with the defined Group and Type performance requirements of SAE AS8090.

3.10 Lifting and tiedown attachments. The EAC110 shall be equipped with lifting/tiedown rings. The rings shall be located such that, four equal length cables to a single hook can hoist the EAC110 without more than a 10 degrees tilt from horizontal in any plane. Spreader bars shall not be required and cables shall not be deflected by the housing structure. Clearance shall be provided for tiedown chains or straps. A lifting and tiedown instruction plate (see 3.13) shall be attached to the EAC110.

A-A-59501

3.11 Sound and electromagnetic interference.

3.11.1 Operational sound levels. The maximum A-weighted sound level produced by the EAC110 shall not exceed 84 dBA, when measured in accordance with SAE ARP1801 (less any requirement for internal combustion engine operation).

3.11.2 Electromagnetic interference (EMI). The EAC110 shall comply with all applicable requirements of SAE J551-1 for electromagnetic radiation and susceptibility. Susceptibility testing shall be in accordance with the requirements of SAE J551-11. Test severity levels shall be as referenced, except all Class C functions shall fall within Region I.

3.12 Cleaning, treatment, and painting. Unless otherwise specified, the EAC110 outer surfaces and the interior surface of hinged doors and access panels shall be painted forest green, color number 24052 of FED-STD-595, with polyurethane paint. The undercarriage may be painted black. The motors and other major components may remain the manufacturer's original colors.

3.13 Identification and instruction nameplates. Identification and operating instruction shall be inscribed on aluminum nameplates. Inscriptions shall tolerate exposure to oil, dirt, sunlight, and detergent solutions without fading or becoming illegible. Nameplates shall be mechanically attached (no adhesives). Chained on metal tags or decals shall not be used. EAC110 nameplates shall be as follows.

3.13.1 Identification. Functional system components, valves, gauges, and switches shall be marked for identification. An end item identification plate shall be mounted on the exterior of the EAC110, with the following information inscribed. The serial number and date of delivery shall be stamped.

Make and Model
National Stock Number
Contract Number
Serial Number
Date of Delivery

3.13.2 Control markings. All controls, valves, gauges, switches, and indicators used in the operation of the systems shall be identified.

3.13.3 Diagrams. Schematic diagrams of the piping and electrical systems shall be provided. Each control, valve, gauge, and switch identified on the diagrams shall correspond to the markings on like parts of the systems.

3.13.4 Operating instructions. Operating and precautionary instructions shall be permanently affixed near the appropriate system control panel. Instructions shall be clear, concise, and enable safe operation of the EAC110 without damage to the equipment or injury to personnel.

A-A-59501

Each control, valve, gauge, and switch identified on the operating instructions shall correspond to the markings on like parts of the systems.

3.13.5 Lubrication plate. A lubrication plate shall show a location for all lubrication points. The plate shall identify type and grade of lubricant, frequency of application or change, and differences based on operational temperatures.

3.14 Workmanship.

3.14.1 Materials. Materials shall be selected for the application based on defined purpose, survivability, exposure, and service life. Components shall perform within their published ratings. Magnesium alloys, wood products, asbestos, Class I or Class II Ozone Depleting Substance/Compound (ODS/ODC) shall not be used. Coatings subject to failure due to environmental and operational extremes shall not be used. Materials used shall not be nutrients for fungi. Contact between metals widely separated in galvanic series, as defined by SAE J447, shall be avoided.

3.14.2 Welding. Welding procedures shall be in accordance with a nationally recognized code. Copies of welder qualification records shall be on file and available for review. Surfaces to be welded shall be free of rust, scale, or foreign material. Welds shall be of a size and shape capable of transmitting the design load without deformation or failure. Weld areas shall be cleaned of scale and spatter prior to application of protective coatings.

3.14.3 Fasteners. Threaded fasteners shall include features to prevent the loss of torque, while allowing for disassembly. Tapped threads into aluminum shall be in accordance with a published standard. Permanently fastened overlapping surfaces shall be sealed. Rivet selection shall be for a minimum joint strength. Rivet heading shall be consistent with published data for a matching application. Adhesive supports for wiring or other components shall not be used.

4. REGULATORY REQUIREMENTS.

4.1 Materials. The contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this CID are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials that have been collected from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this CID.

A-A-59501

5. QUALITY ASSURANCE PROVISIONS.

5.1 Product Conformance. The product provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be substantially the same product offered for sale in the commercial market.

5.2 Contractor requirements. The contractor shall provide the purchaser 30 days notice of verification reviews and demonstrations (see 5.3). Reviews and demonstrations shall be referenced to the salient characteristics or performance requirements of this or a referenced document. The contractor shall provide the purchaser copies of the EAC110 operational, service and maintenance, and parts breakdown technical manuals for review 60 days prior to the time of verification. The contractor's parts manual shall list part numbers for contractor manufactured components and source part numbers for purchased sub-level components and whole components. The contractor shall provide a product familiarization video tape that verbally and visually provides all operational and safety controls information and routine service requirements.

5.3 Verification. Prior to delivery of the first EAC110, the contractor, at his facility, shall review all salient characteristics and shall demonstrate individual performance requirements of the CID or the referenced applicable documents with the purchaser. Where specific certifications are required, copies shall be provided. Performance demonstrations shall be conducted where visual reference cannot establish compliance. Data generated by any performance demonstration shall directly prove the requirement or shall be sufficient for extrapolation to the requirement.

5.4 Reconfiguration Criteria. Failure to verify the requirements of this CID, reference applicable documents, shall be cause for reconfiguration and re-verification. Causes for reconfiguration shall include: incorrect configuration, inability to meet performance requirement, inability to maintain settings, activation of a system safety devise, conditions presenting a safety hazard to a user or a maintainer, component interference, structural failure, misalignments, instability during movement, spillage of fluids (other than water), or overheating.

5.5 Delivery test. Each EAC110 shall be cycled through each mode of operation and shall demonstrate a positive response to the manipulation of all controls. There shall be no sharp edges, no misalignments, no failures in the paint finish, no over-spray, and no leaks. All latches shall function and all lights shall work.

6. PACKAGING. The preservation, packing, and marking shall be as specified in the contract.

7. NOTES.

7.1 Source of documents.

7.1.1 Copies of Federal documents are available from: Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.

A-A-59501

7.1.2 ASHRE documents are available from: American Society of Heating Refrigerating and Air-Conditioning Engineers Inc., 1791 Tullie Circle N.E., Atlanta GA 30329

7.1.3 NFPA documents are available from: National Fire Protection Association, Battery March Park, Quincy MA 02269.

7.1.4 SAE documents are available from: Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale PA 15096.

7.2 Ordering data. The purchaser shall specify the following at the time of purchase:

- a. Title, number, and revision letter, and date of this document.
- b. Packaging requirements (see 5).

7.3 Subject term (key word) listing.

Cooling
Heating
Mobile

Custodians:

Air Force - 99
Army - AV
Navy - SH

Preparing activity:

Air Force - 84

Agent:

Air Force - 99

Civil Agency Coordinating Activity:

GSA - 7FLE

FSC 4120

(Project 4120-1050)

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