

**Comptroller of Public Accounts
Statewide Procurement Division
Contract Category No. 031-A1**

**Texas Specification No. 031-05-01B
Effective Date: February 1, 2010
AIR CONDITIONER, ROOM, COOLING ONLY**

SCOPE: This specification establishes the minimum requirements for self-contained cooling air conditioners, alternating current, hermetic type refrigeration system, air-cooled, window or in-wall units installed in an enclosed space.

A. APPLICABLE SPECIFICATIONS AND STANDARDS:

Reference to specifications, standards, test methods, and other documents must be in effect on the date of the Invitation for Bid (IFB). The following publications form a part of this specification to the extent specified herein:

1. **American Society Of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)**
<https://www.ashrae.org/>
 - a) **ANSI/ASHRAE 15** - Safety Code for Mechanical Refrigeration.
 - b) **ANSI/ASHRAE 16** - Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners.
2. **Association of Home Appliance Manufacturers (AHAM) - ANSI/AHAM RAC-1-1992** -- American National Standard - Room Air Conditioners - www.aham.org
3. **Federal Documents:** www.access.gpo.gov
 - a) **00-A-373** -- Air Conditioners, Single Package Type
 - b) **Code of Federal Regulations:**
 - 1) 10 CFR 430 - Energy Conservation Program for Consumer Products
 - 2) 16 CFR 305 - Rule Concerning Disclosures Regarding Energy Consumption and Water Use of Certain Home Appliances and Other Products Required Under the Energy Policy and Conservation Act ("Appliance Labeling Rule")
 - 3) 29 CFR 1910 - Occupational Safety and Health Standards, Subpart S - Electrical.
4. **Underwriters' Laboratories, Inc. (UL) - UL 484** --UL Standard for Safety for Room Air Conditioners - www.ul.com
5. **Global Engineering Documents**
 - a) Global Engineering Documents is an information specialist company that maintains and provides standards information for numerous organizations.
 - b) Copies of standards may be ordered from Global IHS Standard Documents – www.global.ihs.com

- B. CLASSIFICATION:** Room air conditioners must be classified by size in accordance with cooling capacity (BTUH) and nominal operating voltage as specified in Table No. 1.

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**TABLE NO. 1
CAPACITY and SIZE DESIGNATION**

Cooling Capacity BTUH	Cooling Capacity BTUH	Size Designation ¹ 115 volts	Size Designation ¹ 230/208 volts
MINIMUM	MAXIMUM		
5200	6200	1A	
6000	7000	2A	
6800	8000	3A	
7000	9100	4A	
8800	10600	5A	
10300	12100	6A	6B
11600	13500	7A	7B
12900	15000	8A	8B
14100	16500		9B
15400	18000		10B
16700	19400		11B
17900	20900		12B
19200	22400		13B
20400	23900		14B
21700	25300		15B
23000	26800		16B
24200	28300		17B
25500	29800		18B
26700	31200		19B
28000	32700		20B

¹ 115 volt units are designated by the suffix letter "A"; 230/208 volt units are designated by the suffix letter "B".

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C. DEFINITIONS:

Terminology used in this specification is intended to be generic in nature and consistent with meanings that have been defined through general use, and/or accepted trade practices. Where variant meanings may exist, the applicable interpretation must be determined by the Texas Comptroller of Public Accounts Statewide Procurement Division.

1. **BTUH:** The amount of heat expressed in British Thermal Units (BTU) per hour; a measure of the rate at which heat is gained or lost.
2. **Cooling Capacity:** The measure of the ability of a unit to remove heat from an enclosed space, room or zone, expressed in BTUH.
3. **Energy Efficiency Ratio (EER):** A ratio calculated by dividing the cooling capacity in BTUH by the power input in watts for any given set of rating conditions (BTUH/Watt).
4. **Exhaust Air:** Air removed by an air conditioner from an enclosed space, room, or zone and discharged to the outside atmosphere.
5. **Moisture Removal Capacity (Latent Cooling):** The measure of the ability of a unit to remove moisture from an enclosed space, room or zone, expressed BTUH.
6. **Re-circulated Air:** Air discharged by an air conditioner into an enclosed space, room, or zone when all ventilating dampers are closed.
7. **Sensible Cooling Effect:** The difference between the cooling capacity and the moisture removal capacity expressed in BTUH.

D. REQUIREMENTS: Products furnished under this specification must meet or exceed the following requirements:

1. GENERAL REQUIREMENTS:

- a) Equipment and accessories must be new, unused, and a currently standard product of an established manufacturer, except for such deviations as may be required by this Specification - Reference Section D (2) (a)
- b) Equipment and accessories must be free of rust, corrosion, scratches, dents, or other defects which might affect appearance, normal life, safety or serviceability
- c) Parts and components not specifically mentioned in this specification, but which are required to provide a complete operating unit or which are standard for the model bid, must be included as part of the equipment furnished.
- d) All equipment must be delivered completely assembled, fully aligned, adjusted, serviced, and ready for immediate use.

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- e) Component selection must be in accordance with the component manufacturer's recommendations for maximum life.
- f) All units must meet the applicable safety standards of the Federal Occupational Safety and Health Administration (OSHA).
- g) Details not specified herein must be in accordance with standard commercial practices for products of this type.

2. DESIGN REQUIREMENTS:

- a) Room air conditioners must include a prime source of refrigeration and dehumidification and a means for circulating and cleaning air.
- b) It must be mounted on a suitable chassis or frame, a case or cabinet, and all required wiring, tubing, controls, safety devices, and mounting hardware to provide a completely self-contained, fully functional, high efficiency unit must be included.
- c) Air conditioners and all components must meet the safety requirements of ANSI/ASHRAE 15 and UL 484. Units must be designed for easy access to all components which require servicing or maintenance.

d) Compressor:

- 1) ¹ The compressor must be a hermetically sealed unit designed to meet the rated capacity of the air conditioner.
- 2) It must be permanently sealed in oil, must require no additional lubrication, and must be equipped with an automatic reset thermal overload protector.
- 3) The compressor must be suitably mounted within the cabinet to reduce vibration and noise.
- 4) ¹ Factory authorized re-manufactured compressors are acceptable provided all internal parts are completely new (not reused or rebuilt) and provided the compressor is marked as a factory authorized re-manufactured compressor.

e) Condenser:

- 1) The condenser must be air cooled.
- 2) The evaporator and condenser coils must be seamless copper or aluminum tube with aluminum fins.
- 3) A suitable means must be provided for the collection of evaporator coil condensation and for automatic disposal of the condensation to the outside atmosphere.

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- 4) The unit must be designed to prevent condensation overflow or dripping into the conditioned space or onto any part of the building in which the air conditioner is mounted.
- f) **Fans (Blowers):**
- 1) Evaporator and condenser fans (blowers) must be direct driven from a common motor, and must be designed for quiet, efficient movement of air.
 - 2) The evaporator fan must circulate the air in the conditioned space through the air conditioner re-circulated air) and must have a minimum of two (2) operating speeds.
 - 3) Fan motor must be sealed bearing, permanently lubricated type with overload protective devices.
- g) **Temperature Control Device:**
- 1) Air conditioners must be equipped with a thermostat to automatically cycle the unit on and off with a range of 60 °F to 85 °F minimum.
- h) **Filter:**
- 1) Air conditioners must be equipped with a filter system designed for use at the rate capacity of the unit.
 - 2) The filter media must be washable, unshrinkable, easily replaceable, and readily available from commercial vendors.
- i) **Chassis:**
- 1) Air conditioners must be equipped with a rigid chassis or frame of sufficient strength to support the component parts and maintain their proper alignment.
 - 2) Window/wall units must have a slide-out chassis.
- j) **Cabinet:**
- 1) The cabinet must be constructed of a minimum 20 gauge commercial grade steel, or equivalent aluminum and include inlet and outlet grilles, and any necessary barrier walls and insulation.
 - 2) The cabinet and grilles must be a style suitable for visible installation in an office environment.
 - 3) Outlet grilles must be located along the top of the front face of the unit and must be adjustable to provide good control of conditioned air dispersion.
 - 4) Barrier walls and insulation must be designed for thermal insulation and noise reduction.
 - 5) The cabinet must be corrosion and weather resistant.

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k) Controls:

- 1) Air conditioners must be equipped with easily accessible, factory wired, automatic and manual controls contained within the unit.
- 2) Manual controls must include as a minimum ON/OFF, temperature selector, low cooling, high cooling, two fan speeds and fan only one speed "fan only" is acceptable.
- 3) Damper controls must permit a positive fresh air supply.
- 4) Energy saving functions is preferred.

l) Electrical:

- 1) Air conditioners must be designed for single phase 60 Hz AC operation.
- 2) Input voltages must be as shown in **Table No. One**.
- 3) Air conditioners must be designed for safe operation in accordance with the input voltage range and recommended levels of performance of ANSI/AHAM RAC-1.
- 4) Units must be equipped with a factory wired UL approved electric service connection cord and plug.

m) Refrigerant:

- 1) Air conditioners must be shipped fully charged with refrigerant. The refrigerant must meet the requirements of UL 484 and must be readily available from commercial vendors.
- 2) Tubing used for piping must meet the requirements of ANSI/ASHRAE 15.
- 3) **All units manufactured after January 1, 2010 must contain R410A refrigerant in place of R22 refrigerant.**

n) Mounting:

- 1) Air conditioners must be equipped for either window or wall mounting.
- 2) Window mounts must be 26 inches - 42 inches.
- 3) Dimensional requirements for through-the-wall mounting in pre-existing holes, or requirements for transom, slider and/or casement, or other special window mountings, must be as specified on the purchase order.
- 4) The standard window and/or wall mounting kit must be required. Locking devices must be provided for window mounts.

3. FABRICATION REQUIREMENTS:

- a) **Corrosion:** All materials must be inherently corrosion resistant or must be suitably treated to resist corrosion.
- b) **Finishes:** Organic finishes must be evenly applied, free of thin spots, and durable.

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c) **Parts:** All parts must be properly assembled and aligned; welds must be sound, and mechanical joints must be tight.

d) **Safety:**

- 1) Moving parts and un-insulated live parts must be located, guarded, or enclosed to preclude accidental user contact.
- 2) Units must be neatly finished, and free of sharp edges, projections or other conditions which present potential hazards to the user.

e) **Workmanship:**

- 1) All components and assemblies of the air conditioners must be free from dirt or other extraneous materials, burrs, slivers, rough die, tool and grind marks, dents and cracks.
- 2) Castings, molded parts and stampings, if used, must be free of sand, fins, puts, blow holes, and spurs.
- 3) The surfaces of parts to be welded or brazed must be clean.
- 4) All scale and flux must be removed from the finished weld areas.
- 5) The welds must be smooth. Threaded fasteners must not be missing, broken, cracked, or stripped.

4. PERFORMANCE REQUIREMENTS:

- a) Air conditioners must meet or exceed the recommended levels of performance for all tests prescribed in ANSI/AHAM Standard RAC-1 and UL 484.
- b) Units must also meet or exceed the requirements specified in **Table No. 2** when tested in accordance with Department of Energy regulations:
 - 1) 10 CFR 430
 - 2) ANSI/AHAM RAC-1
 - 3) ASHRAE 16

TABLE No. 2 -PERFORMANCE REQUIREMENTS

Description	Requirements
Cooling Capacity: percent of nameplate rating, minimum	95%
Sensible Cooling: percent of total cooling capacity	60-80%
Re-circulated Air: CFM/1000 BTUH cooling capacity, minimum	20
Energy Efficiency Ratio (EER), minimum	8.5

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5. OPTIONS: When so specified, air conditioners must be equipped with one or more of the following features:

- a) **Exhaust Air:** Units must be equipped to exhaust room air to the outside. Exhaust air flow rate must be a minimum of 2.0 CFM/1000 BTUH cooling capacity.
- b) **Disposable Filter:** Units must be equipped with a disposable filter instead of the washable filter required in Section **D (2) (e)**.

6. INSPECTION:

- a) Inspection and testing must be done by the customer at the destination for the shipment.
- b) In the event products tested fail to meet or exceed all conditions and requirements of this specification, the shipping cost and the cost of testing must be borne by the supplier.

7. Tests:

- a) The products furnished under this specification must be tested by the following methods or approved equally applicable procedures.
- b) Testing must be in accordance with ASHRAE 16, ANSI/AHAM RAC-1, and UL 484.

8. AVAILABILITY OF SERVICE:

- a) Factory authorized service must be available within the State of Texas or within a ten day turn around program.
- b) The contract vendor must supply the contact information of the nearest servicing location to the customer.

9. MANUALS:

- a) Operator/service manuals must be provided with each unit delivered all written in English.
- b) The manuals must be provided at time of delivery.

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10. PACKING and/or PACKAGING:

- a) Packaging for shipment must be in accordance with the manufacturer's standard practice and in a manner readily accepted by common carriers engaged in interstate commerce.
- b) Within the shipping carton, units must be packed in a manner designed to minimize damage during shipment due to rough or improper handling.

11. MARKING AND/OR LABELING:

Each shipping container must be clearly marked with the following:

a) Marking:

- 1) Name of contents, including brand name, if any
- 2) Quantity
- 3) Name and address of the manufacturer
- 4) The following information must either be marked on the container or appear on the shipping documents:
 - aa) Purchase order number
 - bb) Name and address of customer
 - cc) Customer requisition number

b) Labeling:

Air conditioner must be labeled as specified herein.

- 1) **Listing:** Each unit must bear the UL listing mark and the AHAM seal.
- 2) **Nameplate:**
 - aa) Each unit must bear a permanent nameplate in accordance with the marking requirements of UL 484.
 - bb) The nameplate must be conveniently located and must include the manufacturer's name or trademark, the model designation, the certified cooling capacity, the electrical rating the kind and amount of refrigerant, and the factory test pressures for the high and low pressure sides.
- 3) **Energy Consumption:** Each unit must be labeled with energy consumption information in accordance with Federal Trade Commission labeling procedures, 16 CFR 305.

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12. PRODUCT INFORMATION:

Air Conditioner Sizing Guide:

- a) The following guide is based on normal room insulation, average number of sun exposed windows, and two (2) person occupancy.
- b) A smaller capacity unit operating continuously will contribute more to comfort than a larger capacity unit operating intermittently.

Area To Be Cooled in Square Feet	Approximate Cooling BTUH Required ¹
100-150	5,000
150-250	6,000
250-300	7,000
300-350	8,000
350-400	9,000
400-450	10,000
450-550	12,000
550-700	14,000
700-1000	18,000
1000-1200	21,000
1200-1400	23,000
1400-1500	24,000
1500-2000	30,000
2000-2500	34,000

¹ In addition consider:

For very sunny and/or humid locations, add 10%;

Add 500 BTUH per person for more than two (2) people;

Add 4,000 BTUH if area is a kitchen, or contains electrical equipment.