



Portable Air Conditioners

ANSI/AHAM PAC-1-2015



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PREFACE

The Association of Home Appliance Manufacturers develops standards in accordance with AHAM's "Policy and Procedures Governing Technical Standards" which states:

"AHAM Standards shall be in the best interest, mutually, of consumers who use appliances, the industries which provide and service appliances, and other interested parties. They shall relate to actual use conditions, be technically and scientifically sound."

Use or observance of AHAM standards is voluntary.

AHAM standards are presented to the American National Standards Institute (ANSI) for recognition as American National Standards. This standard was so recognized on June 19, 2015 and bears the American National Standard designation ANSI/AHAM PAC-1-2015.

This standard contains test procedures that may be applied to any brand or model of portable air conditioner. Results of tests in accordance with this standard may be publicly stated.

This standard is equivalent to the Canadian Standards Association (CSA) standard, CSA C370 Cooling Performance Standard for Portable Air Conditioners. Technical development of this standard was jointly completed by AHAM and CSA, and the standard is harmonized with CSA C370 to the greatest extent possible.

With regard to safety, AHAM recommends that all appliance products – both major and portable – manufactured or marketed in the United States be submitted to an appropriate independent laboratory such as Underwriters Laboratories, Inc., or the American Gas Association Laboratories, Inc., for inspection and listing in conformance with the safety standards and procedures followed by such laboratories. The relevant standards for portable air conditioners are UL 484, Standard for Safety, Room Air Conditioners, and this standard, ANSI/AHAM PAC-1, Portable Air Conditioners.

AHAM welcomes comments and suggestions regarding this standard. Any standard may be reviewed and improved as needed. All standards must be updated or reconfirmed at least every five years. Any interested party, at any time, may request a change in an AHAM standard. Such request should be addressed to AHAM's President, and should be accompanied by a statement of reason for the request and a suggested alternate proposal.

When metric units are not specified, conversion from customary units should be done in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Metric Practice Guide, and the AHAM SI Metric Practice Guide for the Appliance Industry.

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1. Purpose

This standard establishes a uniform, repeatable procedure or standard method for measuring specified product characteristics of portable air conditioners.

The standard methods and the recommended levels of performance, where they appear, are intended to provide a means to compare and evaluate different brands and models of portable air conditioners regarding characteristics significant to product use.

AHAM recognizes that for single duct condenser configurations of portable air conditioners, air infiltration plays a major role in determining the overall energy efficiency. The effects of air infiltration for these types of products are not presently accounted for in this standard.

This standard applies to cooling performance only and is not intended to cover the heating performance of units with heating function. Heating performance will be considered in a future revision.

The standard methods and the recommended levels of performance are not intended to preclude the exercise of ingenuity or to prevent improvement and innovation in design and performance.

2. Scope

- 2.1 This Standard applies to the cooling performance of portable air conditioners** that have a rated cooling capacity of 19 000 W (65 000 Btu/h) or less and provide cooled air in one of the operating configurations described in Section 4.

Note: The air conditioners described in this Clause include air conditioners with heating capability.

2.2 This Standard does not apply to:

- a) testing and rating of individual assemblies, such as condensing units or direct expansion fan coil units for separate use;
- b) computer or data processing room air conditioners within the scope of ANSI/ASHRAE 127;
- c) room air conditioners within the scope of CAN/CSA-C368.1 or ANSI/AHAM RAC-1; and
- d) the effects of air infiltration on portable air conditioners with single-duct condenser configurations.

2.3 Terminology

In AHAM Standards, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (nonmandatory) to define their application.

2.4 Units of Measurement

The values given in English units are the standard. The values given in parentheses are for information only.

3. Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

ANSI/AHAM (American National Standards Institute/Association of Home Appliance Manufacturers)

PAC-1-2009

Portable Air Conditioners

RAC-1-1982 (R2008)

Room Air Conditioners

ANSI/ASHRAE (American National Standards Institute/American Society for Heating, Refrigerating and Air-Conditioning Engineers)

15 & 34-2010

Safety Standard for Refrigeration Systems/Designation and Safety Classification of Refrigerants

37-2009

Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment

127-2007

Method of Testing for Rating Computer and Data Processing Room Unitary Air-Conditioners

CSA Group

B52-05 (R2009)

Mechanical refrigeration code

C22.1-12

Canadian Electrical Code, Part I

C22.2 No. 117-1970 (R2012)

Room air conditioners

CAN/CSA-C368.1-M90 (R2012)

Performance standard for room air conditioners

CAN/CSA-C370

Cooling performance of portable air conditioners

CAN/CSA-C62301:11

Household electrical appliances — Measurement of standby power

NFPA (National Fire Protection Association)
70 (2011)
National Electrical Code

UL (Underwriters Laboratories Inc.)
484 (2007)
Room Air Conditioners

4. Definitions

4.1 Application Rating

A rating based on tests performed at other than standard rating conditions.

4.2 Condenser

The heat rejection side of a portable air conditioner.

Note: In ANSI/ASHRAE 37, the heat rejection side of a portable air conditioner is termed the “outdoor side”.

4.3 Cooling coil

The room conditioning (cooling) side (i.e., evaporator) of a portable air conditioner.

Note: In ANSI/ASHRAE 37, the room conditioning (cooling) side of a portable air conditioner is termed the “indoor side”.

4.4 Portable Air Conditioner

A single-package air conditioner typically mounted on wheels for moving it from place to place within a building or structure. Portable air conditioners covered by this standard are represented by one of eight operating configurations as shown in Figure 1.

4.5 Dual Duct Cooling Capacity

The measure of the capacity of a portable air conditioner to remove heat from an enclosed space or room. It is measured when the portable air conditioner is tested to configuration 3 (see Table 2).

4.6 Single Duct Cooling Capacity

The measure (Btu/hr) of the capacity of a portable air conditioner to remove heat from an enclosed space or room. It is measured when the portable air conditioner is tested to configuration 5 (see Table 2).

4.7 Spot Cooling Capacity

The measure of the capacity of a portable air conditioner to remove heat from a local zone or area. It is measured when the portable air conditioner is tested to configuration 1 (see Table 2).

4.8 Water Cooled Condenser Capacity

The measure of the capacity of a water cooled portable air conditioner to remove heat from an enclosed space or room. It is measured when the portable air conditioner is tested to configuration 7 (see Table 2).

4.9 Dual Duct Energy Efficiency Ratio (DD - EER)

The ratio calculated by dividing the Dual Duct Cooling Capacity in Btu/hr by the power input in W (see Table 3). This value is determined at standard rating conditions when the portable air conditioner is tested to configuration 3 (see Table 1 and Table 3).

4.10 Single Duct Energy Efficiency Ratio (SD – EER)

The ratio calculated by dividing the Single Duct Cooling Capacity in Btu/hr by the power input in W (see Table 3). This value is determined at standard rating conditions when the portable air conditioner is tested to configuration 5 (see Table 1 and Table 3).

4.11 Spot Cooling Energy Efficiency Ratio (SC - EER)

The ratio calculated by dividing the Spot Cooling Capacity in Btu/hr by the power input in W (see Table 3). This value is determined at standard rating conditions when the portable air conditioner is tested to configuration 1 (see Table 1 and Table 3).

4.12 Water Cooler Condenser Energy Efficiency Ratio (WCC – EER)

The ratio calculated by dividing the Water Cooled Condenser Capacity in Btu/hr by the power input in W (see Table 3). This value is determined at standard rating conditions when the portable air conditioner is tested to configuration 7 (see Table 1 and Table 3).

4.13 Standard Rating

A rating based on tests performed at standard rating conditions as shown in Table 1.

4.14 Standard Rating Condition

The rating conditions specified in Table 4 and used for comparing performance characteristics.

4.15 Standby Power

The power used when a Portable Air Conditioner is in its lowest power consumption mode, is connected to a power supply, and can be switched on by the user directly or by transmitting an indirect signal from a remote device.

4.16 Unit

A Portable Air Conditioner.

5. General Requirements

Portable air conditioners shall be designed, constructed and assembled so as to meet the applicable electrical and refrigeration safety requirements for the U.S. and/or Canadian market, as appropriate.

5.1 For the U.S., applicable requirements are found in:

- (i) ANSI/ASHRAE 15¹;
- (ii) NFPA-70²; and

¹ Copies are available from the American Society of Heating, Refrigerating and Air- Conditioning Engineers, 1791 Tullie Circle, N.E., Atlanta, Georgia 30329 or <http://www.ashrae.org/publications/>

² Copies are available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169 or <http://www.nfpa.org>