BSR/ASHRAE Standard 128-2018R

Public Review Draft

Methods of Rating Portable Air Conditioners

First Public Review (March 2026)
(Complete Draft for Full Review)

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FOREWORD

This is a revision of ANSI/ASHRAE Standard 128-2018, Method of Rating Portable Air Conditioners.

The scope continues to apply to portable air-conditioning units with a cooling capacity of 65,000 Btu/h (19,000 W) and greater. This reflects the fact that smaller portable air conditioners are covered by ANSI/AHAM Standard PAC-1, and a similar standard, Standard C370, has been issued by the Canadian Standards Association. Both of these standards cover portable air conditioners with capacities up to 65,000 Btu/h (19,000 W). Similarly, ISO Standard 18326 covers non-ducted portable air-cooled air conditioners and heat pumps having a single exhaust duct but does not apply to water-cooled air conditioners or heat pumps, or spot coolers.

1. PURPOSE

The purpose of this standard is to establish a uniform set of requirements for rating the cooling capacity of portable air conditioners.

2. SCOPE

2.1 This standard is applicable to commercial-type portable air-conditioning units with a rated cooling capacity of 65,000 Btu/h (19,000 W) and greater, including those with heating capacity.

2.2 This standard does not apply to

a. the 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 Standard 127 [1]; or

c. room air conditioners within the scope of ANSI/AHAM RAC-1 [2].

3. DEFINITIONS

In this standard, the word “shall” is used to express a requirement, 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 sections do not include requirements or alternative requirements; the purpose of a note accompanying a section 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. Legends to equations and figures are considered requirements.

4. GENERAL REQUIREMENTS

4.1 This standard addresses commercial portable air-conditioning units, which essentially consist of a self-contained portable refrigerant-based cooling system to provide localized cooling in industrial and commercial applications.

4.2 Portable air conditioners shall be designed, constructed, and assembled so as to meet the applicable electrical and refrigeration safety requirements as appropriate. Applicable requirements are found in ANSI/ASHRAE Standards 15 [3] and 34 [4].

5. RATINGS REQUIREMENTS

5.1 Standard Cooling Capacity. Standard cooling capacity shall be stated as total (sensible and latent) cooling capacity and shall include the effects of evaporator circulating-fan heat. Input ratings shall be the total power

input to the compressors, fan motors, controls, and pumps.

Ratings of water-cooled units that are not equipped with an integral pump shall include a total allowance for the cooling-tower fan motor and circulating water-pump motor power inputs of 10 W per 1000 Btu/h (34.1 W per 1000 W) cooling capacity.

5.2 Standard Cooling Capacity Rating. Standard cooling capacity ratings shall be expressed in the nearest multiple of 1000 Btu/h (300 W).

5.3 Energy Efficiency Ratio (EER) Ratings. Energy efficiency ratio (EER) in Btu/W·h (W/W) shall be expressed in increments of 0.1.

5.4 Application Ratings. Ratings at conditions of temperature and/or air quantity other than those specified in Section 6 may be established as application ratings and shall be based on the data produced by the tests prescribed in Section 6.

5.5 Published Ratings

5.5.1 The performance ratings (EER and cooling capacity) of portable air conditioners published by the manufacturer in its specifications, literature, or advertising shall be determined by the methods prescribed in Section 6.

5.5.2 The cooling capacity ratings shall be expressed in Btu/h (W) in accordance with the tests defined in Section 6.3. Tons or other units shall not be used as capacity designations.

5.5.3 To comply with this standard, published ratings of standard cooling capacity, standard EER, and power input shall be based on data obtained in accordance with the tests specified in Section 6.

Portable air-conditioning production units, when tested, shall have measured ratings equal to or better than the published ratings, except for an allowance to cover testing and manufacturing variations. The allowance is such that each unit is required to have a measured rating of at least 95% of the unit's publishing rating.

6. TESTS

6.1 Method of Test. Tests shall be conducted in accordance with this standard and the requirements provided in ANSI/ASHRAE Standard 37 [5].

6.2 Setup for Test. The unit shall be leveled for testing, unless the manufacturer's instructions state otherwise.

6.3 Standard Test Conditions for Rating

6.3.1 General. All adjustable settings, such as louvers, fan speed, and special functions, shall be set for maximum capacity.

6.3.2 Standard Voltage and Frequency Rating. Tests shall be performed at the rated voltage and frequency listed on the unit's nameplate. For portable air conditioners with dual voltage ratings, tests shall be performed at both voltages or at the lower of the two voltages if only a single standard voltage rating is to be published.

6.3.3 Equipment Setup for Testing. The portable air conditioner shall be tested with clean filters in place as supplied by the manufacturer. Other equipment recommended by the manufacturer as part of the air conditioner shall be in place as well.

6.3.3.1 Units intended for use with field-installed duct systems shall be tested at the external resistance of 0.5 in. of water (125 Pa).

6.3.3.2 Units intended for use with a supplied duct system shall be tested with the duct attached to the fan outlet and at least a 0.5 in. of water (125 Pa) of external static pressure.

6.3.3.3 Units intended for use as a stand-alone system shall be tested with no external duct attachment such that external static pressure is zero.

6.3.4 Test Parameters for Air and Water. The air and water temperatures shall be as specified in Table 1. For water cooled condenser, the design water flow will be established by setting the inlet water as shown in Table 1, and adjusting the water flow to meet the specified outlet temperature as shown in Table 1.

Table 1 Standard Rating Conditions

Test Configuration	Evaporator Inlet, °F (°C) Dry Bulb/Wet Bulb	Condenser Inlet, °F (°C) Dry Bulb/Wet Bulb	Condenser Outlet, °F (°C)
Air-cooled portable air conditioner	95/75.2 (35/24) or 95/50% rh	95/75.2 (35/24) or 95/50% rh	N/A
Water-cooled portable air conditioner	95/75.2 (35/24) or 95/50% rh	85 (29.4)	95 (35)

6.3.4.1 Test Instrument Tolerances. Instruments and data acquisition instrumentations shall be calibrated per National Institute of Standards and Technology (NIST) requirements and selected to meet the measurement system accuracy specified in this section.

a. Temperature measurement instrumentation tolerance for entering dry bulb and wet bulb air temperature shall be ±0.2°F (±0.1°C).
b. Relative humidity measurement instrumentation tolerance shall be within 0.7%.
c. Temperature measurement instrumentation tolerance for condenser water shall be ±0.5°F (±0.3°C).
d. Water flow measurement instrumentation tolerance shall be ±1.0 of the reading.

6.3.5 Condenser Test Conditions. Testing of the portable air conditioner shall be performed with no duct connections on the condenser side. However, temporary measures may be installed to prevent recirculation on the condenser air. For water-cooled units, the inlet and outlet piping connections shall be installed. Once the setup and water flow is established, the condenser outlet temperature shall remain unchanged throughout the duration of the tests.

6.3.6 Standby Power Consumption. Standby power consumption compared to the consumption of the unit is negligible and does not need to be measured.

6.3.6.1 Tolerances. Test measurement instrumentation tolerance for electrical voltage shall be within 1% of the reading.

6.3.6.2 Voltage Measurements. For three-phase power systems, the measured voltage variations shall be within 10% of each other.

7. SAMPLING PLAN

When establishing the initial ratings for a basic model, a sample of sufficient size shall be tested. The minimum sample size shall be 2, provided that both tests show similar test results within 3%; otherwise, a third test will be required. If a third test is performed, all test results shall be within 5% of the rated value. The sample testing shall be redone if any modification is made to the units that can affect unit performance.

8. NAMEPLATE INFORMATION

A nameplate showing the rating and conformance to this standard shall be easily readable and permanently attached at an accessible location. The nameplate shall show the following at a minimum:

a. Cooling capacity as applicable
b. Standard EER rating

9. NORMATIVE REFERENCES

1. ASHRAE. 2020. ANSI/ASHRAE Standard 127, *Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners*. Peachtree Corners, GA: ASHRAE.
2. AHAM. 2020. ANSI/AHAM RAC-1, *Energy Measurement Test Procedure for Room Air Conditioners*. Washington, DC: Association of Home Appliance Manufacturers.
3. ASHRAE. 2024. ANSI/ASHRAE Standard 15, *Safety Standard for Refrigeration Systems*. Peachtree Corners, GA: ASHRAE.
4. ASHRAE. 2024. ANSI/ASHRAE Standard 34, *Designation and Safety Classification of Refrigerants*. Peachtree Corners, GA: ASHRAE.

5. ASHRAE. 2024. ANSI/ASHRAE Standard 37, *Methods of Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment*. Peachtree Corners, GA: ASHRAE.
6. CSA. 2013. CAN/CSA C370 (R2022), *Cooling Performance of Portable Air Conditioners*. Toronto, ON: Canadian Standards Association.
7. ISO. 2018. ISO 18326, *Non-ducted portable air-cooled air conditioners and air-to-air heat pumps having a single exhaust duct — Testing and rating for performance*. Geneva, Switzerland: International Organization for Standardization.