Natural Resources Canada | Ressources naturelles Canada

TECHNICAL STANDARDS DOCUMENT
D2SA001, Revision 00

Testing Standard and Energy Efficiency Standards for Room Air Conditioners

The testing standard and energy efficiency standards text of this document are based on the *United States Code of Federal Regulations* *Appendix F to Subpart B of Part 430 of Title 10* amended as of May 7, 2021 and *subsection 430.32(b) of Subpart C of Part 430 of Title 10* amended as of December 18, 2023.

Publication Date: April 9, 2025
Version Date: April 9, 2025

(Ce document est aussi disponible en français)

Canada

Contents

Tables

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

General Information

Introduction

As defined by section 20.2 of the Energy Efficiency Act (EEA), a Technical Standards Document (TSD) is a document that is published in both official languages by the Minister, and that adapts, combines or reproduces, in whole or in part, documents that are produced by jurisdictions, standards development organizations or industry associations. The adaptations may include modifications to the content of the originating document. For energy-using products or classes of energy-using products, a TSD sets out requirements or guidance related to those requirements.

The Energy Efficiency Regulations, 2016 (EER) may contain provisions setting out that the provisions of the EER prevail over the provisions of the TSD in the case of inconsistency. Consequently, it is advisable to read a TSD in conjunction with the EER. As a guide, where the EER contains a provision that specifies additional requirements or removes requirements from the TSD, footnotes will refer the reader to that provision of the EER.

When the TSD is amended, a Notice of Revision is published on the Natural Resources Canada regulatory announcement website. An amended TSD, from time to time, includes amendments made to the originating enactment or material, with adaptations as required. All TSDs are assigned a revision number, with “Revision 00” designating the initial version.

Identification of Changes

Adaptations may be made that include amendments to the content of the originating enactment or material. Such adaptations are marked as follows:

- Underlined text (except hyperlinks) indicates text that is not part of the originating enactment or material, and which therefore represents additional text in comparison to the originating text.
- Struck out text is text reproduced from the originating enactment or material that has been deleted from the TSD and thus it is not to be read as part of the TSD nor as part of the material incorporated by reference into the EER.
- “CONTENT NOT REPRODUCED” informs the reader that the text of the corresponding provision of the originating enactment or material has not been reproduced in the TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

Publication and Version Dates

- The publication date is the date the TSD first appears on the NRCan website.
- The version date is the latest date of the latest version of the TSD.

Users of this document should consult enabling regulations and/or guidance documents to understand when this document can be used.

Non-statutory document: Technical Standards Documents

This TSD is a non-statutory document incorporated by reference in the *Energy Efficiency Regulations.* This TSD is not subject to requirements of the *Statutory Instruments Act.*

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

Part 1: Testing Standard for Room Air Conditioners

Adapted from United States Code of Federal Regulations *Appendix F to Subpart B of Part 430 of Title 10* amended as of *May 7, 2021.*

Part 1 contents:

0. Incorporation by Reference

(back to Part 1 contents)

Are incorporated by reference the entire standard for AHAM RAC-1, ANSI/ASHRAE 16, ANSI/ASHRAE 41.1, ASHRAE 41.2-1987 (RA 1992), ASHRAE 41.3-2014, ASHRAE 41.6-2014, ASHRAE 41.11-2014 and IEC 62301. However, only enumerated provisions of AHAM RAC-1 and ANSI/ASHRAE 16 apply to this TSD, as follows:

(1) ANSI/AHAM RAC-1:

(i) Section 4 - Testing Conditions, Section 4.1 - General

(ii) Section 5 - Standard Measurement Test, Section 5.2 - Standard Test Conditions: 5.2.1.1

(iii) Section 6 - Tests and Measurements, Section 6.1 - Cooling capacity

(iv) Section 6 - Tests and Measurements, Section 6.2 - Electrical Input

(2) ANSI/ASHRAE 16:

(i) Section 3 - Definitions

(ii) Section 5 - Instruments

(iii) Section 6 - Apparatus, Section 6.1 - Calorimeters, Sections 6.1.1-6.1.1., 6.1.1.3a, 6.1.1.4-6.1.4, including Table 1

(iv) Section 7 - Methods of Testing, Section 7.1 - Standard Test Methods, Section 7.1a, 7.1.1a

(v) Section 8 - Test Procedures, Section 8.1 - General

(vi) Section 8 - Test Procedures, Section 8.2 - Test Room Requirements

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

(viii) Section 8 - Test Procedures, Section 8.3 - Air Conditioner Break-In

(ix) Section 8 - Test Procedures, Section 8.4 - Air Conditioner Installation

(x) Section 8 - Test Procedures, Section 8.5 - Cooling Capacity Test

(xi) Section 9 - Data to Be Recorded, Section 9.1

(xii) Section 10 - Measurement Uncertainty

(xiii) Normative Appendix A Cooling Capacity Calculations - Calorimeter Test Indoor and Calorimeter Test Outdoor

If there is any conflict between any industry standard(s) and this TSD, follow the language of the test procedure in this TSD, disregarding the conflicting industry standard language.

1. Scope

(back to Part 1 table of contents)

This TSD contains the test requirements to measure the energy performance of a room air conditioner.

2. Definitions

(back to Part 1 contents)

2.1 ***"Active mode"*** means a mode in which the room air conditioner is connected to a mains power source, has been activated and is performing any of the following functions: Cooling or heating the conditioned space, or circulating air through activation of its fan or blower, with or without energizing active air-cleaning components or devices such as ultra-violet (UV) radiation, electrostatic filters, ozone generators, or other air-cleaning devices.

2.2 ***"ANSI/AHAM RAC-1"*** means the test standard published jointly by the American National Standards Institute and the Association of Home Appliance Manufacturers, titled "Energy Measurement Test Procedure for Room Air Conditioners," Standard RAC-1-2020 (incorporated by reference).

2.3 ***"ANSI/ASHRAE 16"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners," Standard 16-2016 (incorporated by reference).

2.4 ***"ANSI/ASHRAE 41.1"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Standard Method for Temperature Measurement," Standard 41.1-2013 (incorporated by reference).

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

2.5 ***"ASHRAE 41.2-1987 (RA 1992)"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Standard Methods for Laboratory Airflow Measurement," Standard 41.2-1987 (RA 1992) (incorporated by reference).

2.6 ***"ASHRAE 41.3-2014"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Standard Methods for Pressure Measurement," Standard 41.3-2014 (incorporated by reference).

2.7 ***"ASHRAE 41.6-2014"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Standard Method for Humidity Measurement," Standard 41.6-2014 (incorporated by reference).

2.8 ***"ASHRAE 41.11-2014"*** means the test standard published jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers titled "Standard Methods for Power Measurement," Standard 41.11-2014 (incorporated by reference).

2.9 ***"Combined energy efficiency ratio"*** means the energy efficiency of a room air conditioner in British thermal units per watt-hour (Btu/Wh) and determined in section 5.2.2 of this TSD for single-speed room air conditioners and section 5.3.12 of this TSD for variable-speed room air conditioners.

2.10 ***"Cooling capacity"*** means the amount of cooling, in British thermal units per hour (Btu/h), provided to a conditioned space, measured under the specified conditions and determined in section 4.1 of this TSD.

2.11 ***"Cooling mode"*** means an active mode in which a room air conditioner has activated the main cooling function according to the thermostat or temperature sensor signal or switch (including remote control).

2.12 ***"Full compressor speed (full)"*** means the compressor speed at which the unit operates at full load test conditions, when using user settings with a unit thermostat setpoint of 75 °F to achieve maximum cooling capacity, according to the instructions in ANSI/ASHRAE Standard 16-2016.

2.13 ***"IEC 62301"*** means the test standard published by the International Electrotechnical Commission, titled "Household electrical appliances - Measurement of standby power," Publication 62301 (Edition 2.0 2011-01), (incorporated by reference).

2.14 ***"Inactive mode"*** means a standby mode that facilitates the activation of active mode by remote switch (including remote control) or internal sensor or which provides continuous status display.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

2.15 ***"Intermediate compressor speed (intermediate)"*** means the compressor speed higher than the low compressor speed at which the measured capacity is higher than the capacity at low compressor speed by one third of the difference between $Capacity_4$, the measured cooling capacity at test condition 4 in Table 1 of this TSD, and $Capacity_1$, the measured cooling capacity with the full compressor speed at test condition 1 in Table 1 of this TSD, with a tolerance of plus 5 percent (designs with non-discrete speed stages) or the next highest inverter frequency step (designs with discrete speed steps), achieved by following the instructions certified by the manufacturer.

2.16 ***"Low compressor speed (low)"*** means the compressor speed at which the unit operates at low load test conditions, achieved by following the instructions certified by the manufacturer, such that $Capacity_4$, the measured cooling capacity at test condition 4 in Table 1 of this TSD, is no less than 47 percent and no greater than 57 percent of $Capacity_1$, the measured cooling capacity with the full compressor speed at test condition 1 in Table 1 of this TSD.

2.17 ***"Off mode"*** means a mode in which a room air conditioner is connected to a mains power source and is not providing any active or standby mode function and where the mode may persist for an indefinite time, including an indicator that only shows the user that the product is in the off position.

2.18 ***"Single-speed room air conditioner"*** means a type of room air conditioner that cannot automatically adjust the compressor speed based on detected conditions.

2.19 ***"Standby mode"*** means any product mode where the unit is connected to a mains power source and offers one or more of the following user-oriented or protective functions which may persist for an indefinite time:

(a) To facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer. A timer is a continuous clock function (which may or may not be associated with a display) that provides regular scheduled tasks (*e.g.*, switching) and that operates on a continuous basis.

(b) Continuous functions, including information or status displays (including clocks) or sensor-based functions.

2.20 ***"Theoretical comparable single-speed room air conditioner"*** means a theoretical single-speed room air conditioner with the same cooling capacity and electrical power input as the variable-speed room air conditioner under test, with no cycling losses considered, at test condition 1 in Table 1 of this TSD.

2.21 ***"Variable-speed compressor"*** means a compressor that can vary its rotational speed in non-discrete stages or discrete steps from low to full.

2.22 ***"Variable-speed room air conditioner"*** means a type of room air conditioner that can automatically adjust compressor speed based on detected conditions.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

3. Test Methods and General Instructions

(back to Part 1 contents)

3.1 ***Cooling mode.*** The test method for testing room air conditioners in cooling mode ("cooling mode test") consists of applying the methods and conditions in AHAM RAC-1 Section 4, Paragraph 4.1 and for single-speed room air conditioners, Section 5, Paragraph 5.2.1.1, and for variable-speed room air conditioners, Section 5, Paragraph 5.2.1.2, except in accordance with ANSI/ASHRAE 16, including the references to ANSI/ASHRAE 41.1, ANSI/ASHRAE 41.2-1987 (RA 1992), ANSI/ASHRAE 41.3-2014, ANSI/ASHRAE 41.6-2014, and ANSI/ASHRAE 41.11-2014, all referenced therein, as defined in sections 2.3 through 2.8 of this TSD. Use the cooling capacity simultaneous indoor calorimeter and outdoor calorimeter test method in Section 7.1.a and Sections 8.1 through 8.5 of ANSI/ASHRAE 16, except as otherwise specified in this TSD. If a unit can operate on multiple operating voltages as distributed in commerce by the manufacturer, test it and rate the corresponding basic models at all nameplate operating voltages. For a variable-speed room air conditioner, test the unit following the cooling mode test a total of four times: One test at each of the test conditions listed in Table 1 of this TSD, consistent with section 4.1 of this TSD.

3.1.1 ***Through-the-wall installation.*** Install a non-louvered room air conditioner inside a compatible wall sleeve with the provided or manufacturer-required rear grille, and with only the included trim frame and other manufacturer-provided installation materials, per manufacturer instructions provided to consumers.

3.1.2 ***Power measurement accuracy.*** All instruments used for measuring electrical inputs to the test unit, reconditioning equipment, and any other equipment that operates within the calorimeter walls must be accurate to ±0.5 percent of the quantity measured.

3.1.3 ***Electrical supply.*** For cooling mode testing, test at each nameplate operating voltage, and maintain the input standard voltage within ±1 percent. Test at the rated frequency, maintained within ±1 percent.

3.1.4 ***Control settings.*** If the room air conditioner has network capabilities, all network features must be disabled throughout testing.

3.1.5 ***Measurement resolution.*** Record measurements at the resolution of the test instrumentation.

3.1.6 ***Temperature tolerances.*** Maintain each of the measured chamber dry-bulb and wet-bulb temperatures within a range of 1.0 °F.

3.2 ***Standby and off modes.***

3.2.1 Install the room air conditioner in accordance with Section 5, Paragraph 5.2 of IEC 62301 and maintain the indoor test conditions (and outdoor test conditions where applicable) as required by Section 4, Paragraph 4.2 of IEC 62301. If testing is not conducted in a facility used for testing cooling mode performance, the test facility must comply with Section 4, Paragraph 4.2 of IEC 62301.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

3.2.2 ***Electrical supply.*** For standby mode and off mode testing, maintain the electrical supply voltage and frequency according to the requirements in Section 4, Paragraph 4.3.1 of IEC 62301.

3.2.3 ***Supply voltage waveform.*** For the standby mode and off mode testing, maintain the electrical supply voltage waveform indicated in Section 4, Paragraph 4.3.2 of IEC 62301.

3.2.4 ***Wattmeter.*** The wattmeter used to measure standby mode and off mode power consumption must meet the resolution and accuracy requirements in Section 4, Paragraph 4.4 of IEC 62301.

3.2.5 ***Air ventilation damper.*** If the unit is equipped with an outdoor air ventilation damper, close this damper during standby mode and off mode testing.

4. Test Conditions and Measurements

(back to Part 1 contents)

4.1 ***Cooling mode.***

4.1.1 ***Temperature conditions.*** Establish the test conditions described in Sections 4 and 5 of AHAM RAC-1 and in accordance with ANSI/ASHRAE 16, including the references to ANSI/ASHRAE 41.1 and ANSI/ASHRAE 41.6-2014, for cooling mode testing, with the following exceptions for variable-speed room air conditioners: Conduct the set of four cooling mode tests with the test conditions presented in Table 1 of this TSD. For test condition 1 and test condition 2, achieve the full compressor speed with user settings, as defined in section 2.12 of this TSD. For test condition 3 and test condition 4, set the required compressor speed in accordance with instructions the manufacturer provided.

Table 1: Indoor and Outdoor Inlet Air Test Conditions - Variable-Speed Room Air Conditioners

Test condition	Evaporator inlet (indoor) air, °F		Condenser inlet (outdoor) air, °F		Compressor speed
	Dry bulb	Wet bulb	Dry bulb	Wet bulb	
Test Condition 1	80	67	95	75	Full
Test Condition 2	80	67	92	72.5	Full
Test Condition 3	80	67	87	69	Intermediate
Test Condition 4	80	67	82	65	Low

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

4.1.2 ***Cooling capacity and power measurements.*** For single-speed units, measure the cooling mode cooling capacity (expressed in Btu/h), Capacity, and electrical power input (expressed in watts), $P_{cool,}$ in accordance with Section 6, Paragraphs 6.1 and 6.2 of AHAM RAC-1, respectively, and in accordance with ANSI/ASHRAE 16, including the references to ANSI/ASHRAE 41.2-1987 (RA 1992) and ANSI/ASHRAE 41.11-2014. For variable-speed room air conditioners, measure the condition-specific cooling capacity (expressed in Btu/h), $Capacity_{tc}$, and electrical power input (expressed in watts), P_{tc}, for each of the four cooling mode rating test conditions (tc), as required in Section 6, Paragraphs 6.1 and 6.2, respectively, of AHAM RAC-1, respectively, and in accordance with ANSI/ASHRAE 16, including the references to ANSI/ASHRAE 41.2-1987 (RA 1992) and ANSI/ASHRAE 41.11-2014.

4.2 ***Standby and off modes.*** Establish the testing conditions set forth in section 3.2 of this TSD, ensuring the unit does not enter any active mode during the test. For a unit that drops from a higher power state to a lower power state as discussed in Section 5, Paragraph 5.1, Note 1 of IEC 62301, allow sufficient time for the room air conditioner to reach the lower power state before proceeding with the test measurement. Use the sampling method test procedure specified in Section 5, Paragraph 5.3.2 of IEC 62301 for testing all standby and off modes, with the following modifications: Allow the product to stabilize for 5 to 10 minutes and use an energy use measurement period of 5 minutes.

4.2.1 If the unit has an inactive mode, as defined in section 2.14 of this TSD, measure and record the average inactive mode power, $P_{ia,}$ in watts.

4.2.2 If the unit has an off mode, as defined in section 2.17 of this TSD, measure and record the average off mode power, P_{om}, in watts.

5. Calculations

(back to Part 1 contents)

5.1 ***Annual energy consumption in inactive mode and off mode.*** Calculate the annual energy consumption in inactive mode and off mode, $AEC_{ia/om,}$ expressed in kilowatt-hours per year (kWh/year).

$$AEC_{ia/om} = (P_{ia} \times t_{ia} + P_{om} \times t_{om})$$

Where:

$AEC_{ia/om}$ = annual energy consumption in inactive mode and off mode, in kWh/year.

P_{ia} = average power in inactive mode, in watts, determined in section 4.2 of this TSD.

P_{om} = average power in off mode, in watts, determined in section 4.2 of this TSD.

t_{ia} = annual operating hours in inactive mode and multiplied by a 0.001 kWh/Wh conversion factor from watt-hours to kilowatt-hours. This value is 5.115 kWh/W if the unit has inactive mode and no off mode, 2.5575 kWh/W if the unit has both inactive and off mode, and 0 kWh/W if the unit does not have inactive mode.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

t_{om} = annual operating hours in off mode and multiplied by a 0.001 kWh/Wh conversion factor from watt-hours to kilowatt-hours. This value is 5.115 kWh/W if the unit has off mode and no inactive mode, 2.5575 kWh/W if the unit has both inactive and off mode, and 0 kWh/W if the unit does not have off mode.

5.2 ***Combined energy efficiency ratio for single-speed room air conditioners.*** Calculate the combined energy efficiency ratio for single-speed room air conditioners as follows:

5.2.1 ***Single-speed room air conditioner annual energy consumption in cooling mode.*** Calculate the annual energy consumption in cooling mode for a single-speed room air conditioner, $AEC_{cool,}$ expressed in kWh/year.

$$AEC_{cool} = 0.75 \times P_{cool}$$

Where:

AEC_{cool} = single-speed room air conditioner annual energy consumption in cooling mode, in kWh/year.

P_{cool} = single-speed room air conditioner average power in cooling mode, in watts, determined in section 4.1.2 of this TSD.

0.75 is 750 annual operating hours in cooling mode multiplied by a 0.001 kWh/Wh conversion factor from watt-hours to kilowatt-hours.

5.2.2 ***Single-speed room air conditioner combined energy efficiency ratio.*** Calculate the combined energy efficiency ratio, CEER, expressed in Btu/Wh, as follows:

$$CEER = \left[\frac{Capacity}{\left(\frac{AEC_{cool} + AEC_{ia/om}}{0.75}\right)}\right]$$

Where:

CEER = combined energy efficiency ratio, in Btu/Wh.

Capacity = single-speed room air conditioner cooling capacity, in Btu/h, determined in section 4.1.2 of this TSD.

AEC_{cool} = single-speed room air conditioner annual energy consumption in cooling mode, in kWh/year, calculated in section 5.2.1 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

$AEC_{ia/om}$ = annual energy consumption in inactive mode and off mode, in kWh/year, calculated in section 5.1 of this TSD.

0.75 as defined in section 5.2.1 of this TSD.

5.3 ***Combined energy efficiency ratio for variable-speed room air conditioners.*** Calculate the combined energy efficiency ratio for variable-speed room air conditioners as follows:

5.3.1 ***Weighted electrical power input.*** Calculate the weighted electrical power input in cooling mode, $P_{wt,}$ expressed in watts, as follows:

$$P_{wt} = \Sigma_{tc}\, P_{tc} \times W_{tc}$$

Where:

P_{wt} = weighted electrical power input, in watts, in cooling mode.

P_{tc} = electrical power input, in watts, in cooling mode for each test condition in Table 1 of this TSD.

W_{tc} = weighting factors for each cooling mode test condition: 0.08 for test condition 1, 0.20 for test condition 2, 0.33 for test condition 3, and 0.39 for test condition 4. tc represents the cooling mode test condition: "1" for test condition 1 (95 °F condenser inlet dry-bulb temperature), "2" for test condition 2 (92 °F), "3" for test condition 3 (87 °F), and "4" for test condition 4 (82 °F).

5.3.2 ***Theoretical comparable single-speed room air conditioner.*** Calculate the cooling capacity, expressed in Btu/h, and the electrical power input, expressed in watts, for a theoretical comparable single-speed room air conditioner at all cooling mode test conditions.

$$Capacity_{ss\_tc} = Capacity_1 \times (1 + (M_c \times (95 - T_{tc})))$$

$$P_{ss\_tc} = P_1 \times (1 - (M_p \times (95 - T_{tc})))$$

Where:

$Capacity_{ss\_tc}$ = theoretical comparable single-speed room air conditioner cooling capacity, in Btu/h, calculated for each of the cooling mode test conditions in Table 1 of this TSD.

$Capacity_1$ = variable-speed room air conditioner unit's cooling capacity, in Btu/h, determined in section 4.1.2 of this TSD for test condition 1 in Table 1 of this TSD.

P_{ss_tc} = theoretical comparable single-speed room air conditioner electrical power input, in watts, calculated for each of the cooling mode test conditions in Table 1 of this TSD.

P_1 = variable-speed room air conditioner unit's electrical power input, in watts, determined in section 4.1.2 of this TSD for test condition 1 in Table 1 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

M_c = adjustment factor to determine the increased capacity at lower outdoor test conditions, 0.0099 per °F.

M_p = adjustment factor to determine the reduced electrical power input at lower outdoor test conditions, 0.0076 per °F.

95 is the condenser inlet dry-bulb temperature for test condition 1 in Table 1 of this TSD, 95 °F.

T_{tc} = condenser inlet dry-bulb temperature for each of the test conditions in Table 1 of this TSD (in °F).

tc as explained in section 5.3.1 of this TSD.

5.3.3 ***Variable-speed room air conditioner unit's annual energy consumption for cooling mode at each cooling mode test condition.*** Calculate the annual energy consumption for cooling mode under each test condition, $AEC_{tc,}$ expressed in kilowatt-hours per year (kWh/year), as follows:

$$AEC_{tc} = 0.75 \times P_{tc}$$

Where:

AEC_{tc} = variable-speed room air conditioner unit's annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this TSD.

P_{tc} = as defined in section 5.3.1 of this TSD.

0.75 as defined in section 5.2.1 of this TSD.

tc as explained in section 5.3.1 of this TSD.

5.3.4 ***Variable-speed room air conditioner weighted annual energy consumption.*** Calculate the weighted annual energy consumption in cooling mode for a variable-speed room air conditioner, $AEC_{wt,}$ expressed in kWh/year.

$$AEC_{wt} = \Sigma_{tc}\, AEC_{tc} \times W_{tc}$$

Where:

AEC_{wt} = weighted annual energy consumption in cooling mode for a variable-speed room air conditioner, expressed in kWh/year.

AEC_{tc} = variable-speed room air conditioner unit's annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this TSD, determined in section 5.3.3 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

W_{tc} = weighting factors for each cooling mode test condition: 0.08 for test condition 1, 0.20 for test condition 2, 0.33 for test condition 3, and 0.39 for test condition 4.

tc as explained in section 5.3.1 of this TSD.

5.3.5 ***Theoretical comparable single-speed room air conditioner annual energy consumption in cooling mode at each cooling mode test condition.*** Calculate the annual energy consumption in cooling mode for a theoretical comparable single-speed room air conditioner for cooling mode under each test condition, AEC_{ss_tc}, expressed in kWh/year.

$AEC_{ss\_tc} = 0.75 \times P_{ss\_tc}$

Where:

AEC_{ss_tc} = theoretical comparable single-speed room air conditioner annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this TSD.

P_{ss_tc} = theoretical comparable single-speed room air conditioner electrical power input, in watts, in cooling mode for each test condition in Table 1 of this TSD, determined in section 5.3.2 of this TSD.

0.75 as defined in section 5.2.1 of this TSD.

tc as explained in section 5.3.1 of this TSD.

5.3.6 ***Variable-speed room air conditioner combined energy efficiency ratio at each cooling mode test condition.*** Calculate the variable-speed room air conditioner unit's combined energy efficiency ratio, $CEER_{tc}$, for each test condition, expressed in Btu/Wh.

$$CEER_{tc} = \left[\frac{Capacity}{\left(\frac{AEC_{tc} + AEC_{ia/om}}{0.75}\right)}\right]$$

Where:

$CEER_{tc}$ = variable-speed room air conditioner unit's combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

$Capacity_{tc}$ = variable-speed room air conditioner unit's cooling capacity, in Btu/h, for each test condition in Table 1 of this TSD, determined in section 4.1.2 of this TSD.

AEC_{tc} = variable-speed room air conditioner unit's annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this TSD, determined in section 5.3.3 of this TSD.

$AEC_{ia/om}$ = annual energy consumption in inactive mode and off mode, in kWh/year, determined in section 5.1 of this TSD.

0.75 as defined in section 5.2.1 of this TSD.

tc as explained in section 5.3.1 of this TSD.

5.3.7 ***Theoretical comparable single-speed room air conditioner combined energy efficiency ratio.*** Calculate the combined energy efficiency ratio for a theoretical comparable single-speed room air conditioner, $CEER_{ss\_tc}$, for each test condition, expressed in Btu/Wh.

$$CEER_{ss\_tc} = \left[\frac{Capacity_{ss\_tc}}{\left(\frac{AEC_{ss\_tc} + AEC_{ia/om}}{0.75}\right)}\right]$$

Where:

$CEER_{ss\_tc}$ = theoretical comparable single-speed room air conditioner combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this TSD.

$Capacity_{ss\_tc}$ = theoretical comparable single-speed room air conditioner cooling capacity, in Btu/h, for each test condition in Table 1 of this TSD, determined in section 5.3.2 of this TSD.

AEC_{ss_tc} = theoretical comparable single-speed room air conditioner annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this TSD, determined in section 5.3.5 of this TSD.

$AEC_{ia/om}$ = annual energy consumption in inactive mode and off mode, in kWh/year, determined in section 5.1 of this TSD.

0.75 as defined in section 5.2.1 of this TSD.

tc as explained in section 5.3.1 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

5.3.8 ***Theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio.*** Calculate the adjusted combined energy efficiency ratio, for a theoretical comparable single-speed room air conditioner, $CEER_{ss\_tc\_adj}$, with cycling losses considered, for each test condition, expressed in Btu/Wh.

$$CEER_{ss\_tc\_adj} = CEER_{ss\_tc} \times CLF_{tc}$$

Where:

$CEER_{ss\_tc\_adj}$ = theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this TSD.

$CEER_{ss\_tc}$ = theoretical comparable single-speed room air conditioner combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this TSD, determined in section 5.3.7 of this TSD.

CLF_{tc} = cycling loss factor for each test condition; 1 for test condition 1, 0.956 for test condition 2, 0.883 for test condition 3, and 0.810 for test condition 4.

tc as explained in section 5.3.1 of this TSD.

5.3.9 ***Weighted combined energy efficiency ratio.*** Calculate the weighted combined energy efficiency ratio for the variable-speed room air conditioner unit, $CEER_{wt}$, and theoretical comparable single-speed room air conditioner, $CEER_{ss\_wt}$, expressed in Btu/Wh.

$$CEER_{wt} = \Sigma_{tc}\, CEER_{tc} \times W_{tc}$$

$$CEER_{ss\_wt} = \Sigma_{tc}\, CEER_{ss\_tc\_adj} \times W_{tc}$$

Where:

$CEER_{wt}$ = variable-speed room air conditioner unit's weighted combined energy efficiency ratio, in Btu/Wh.

$CEER_{ss\_wt}$ = theoretical comparable single-speed room air conditioner weighted combined energy efficiency ratio, in Btu/Wh.

$CEER_{tc}$ = variable-speed room air conditioner unit's combined energy efficiency ratio, in Btu/Wh, at each test condition in Table 1 of this TSD, determined in section 5.3.6 of this TSD.

$CEER_{ss\_tc\_adj}$ = theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio, in Btu/Wh, at each test condition in Table 1 of this TSD, determined in section 5.3.8 of this TSD.

W_{tc} as defined in section 5.3.4 of this TSD.

tc as explained in section 5.3.1 of this TSD.

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

5.3.10 ***Variable-speed room air conditioner performance adjustment factor.*** Calculate the variable-speed room air conditioner unit's performance adjustment factor, F_p.

$$F_p = \left[\frac{CEER_t - CEER_{ss\_wt}}{CEER_{ss\_wt}}\right]$$

Where:

F_p = variable-speed room air conditioner unit's performance adjustment factor.

$CEER_{wt}$ = variable-speed room air conditioner unit's weighted combined energy efficiency ratio, in Btu/Wh, determined in section 5.3.9 of this TSD.

$CEER_{ss\_wt}$ = theoretical comparable single-speed room air conditioner weighted combined energy efficiency ratio, in Btu/Wh, determined in section 5.3.9 of this TSD.

5.3.11 ***Variable-speed room air conditioner combined energy efficiency ratio.*** Calculate the combined energy efficiency ratio, CEER, expressed in Btu/Wh, for variable-speed air conditioners.

$$CEER = CEER_1 \times (1 + F_p)$$

Where:

CEER = combined energy efficiency ratio, in Btu/Wh.

$CEER_1$ = variable-speed room air conditioner combined energy efficiency ratio for test condition 1 in Table 1 of this TSD, in Btu/Wh, determined in section 5.3.6 of this TSD.

F_p = variable-speed room air conditioner performance adjustment factor, determined in section 5.3.10 of this TSD.

[86 FR 16476, Mar. 29, 2021, as amended at 86 FR 24484, May 7, 2021]

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

Part 2: Energy Efficiency Standards for Room Air Conditioners

Adapted from United States Code of Federal Regulations subsection 430.32(b) of Subpart C of Part 430 of Title 10 amended as of *December 18, 2023.*

Table 2: Energy Efficiency Standards for Room Air Conditioners manufactured on or after June 1, 2014, but before May 26, 2026

Product class, Btu/h	**Energy Efficiency Standard** (Minimum CEER)
With louvred sides	
Without reverse cycle:	
Less than 6000	11.0
6000 to 7999	11.0
8000 to 13 999	10.9
14 000 to 19 999	10.7
20 000 and 27 999	9.4
28 000 or more	9.0
With reverse cycle:	
Less than 20 000	9.8
20 000 or more	9.3
Without louvred sides	
Without reverse cycle:	
Less than 6000	10.0
6000 to 7999	10.0
8000 to 10 999	9.6
11 000 to 13 999	9.5
14 000 to 19 999	9.3
20 000 or more	9.4

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

With reverse cycle:	
Less than 14 000	9.3
14 000 or more	8.7
Separate product classes	
Casement-only	9.5
Casement-slider	10.4

Table 3 - Energy Efficiency Standards for Room Air Conditioners manufactured on or after May 26, 2026

Product class, Btu/h	**Energy Efficiency Standard** (Minimum CEER)
With louvred sides	
Without reverse cycle:	
Less than 6000	13.1
6000 to 7999	13.7
8000 to 13 999	16.0
14 000 to 19 999	16.0
20 000 and 27 999	13.8
28 000 or more	13.2
With reverse cycle:	
Less than 20 000	14.4
20 000 or more	13.7
Without louvred sides	
Without reverse cycle:	
Less than 6000	12.8
6000 to 7999	12.8
8000 to 10 999	14.1
11 000 to 13 999	13.9
14 000 to 19 999	13.7
20 000 or more	13.8

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

With reverse cycle:	
Less than 14 000	13.7
14 000 or more	12.8
Separate product classes	
Casement-only	13.9
Casement-slider	15.3

© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025