BSR/ASHRAE/IES Addendum bn
to ANSI/ASHRAE/IES Standard 90.1-2016

Public Review Draft

Proposed Addendum bn to Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings

First Public Review (November 2018)
(Draft Shows Proposed Changes to Current Standard)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at www.ashrae.org/standards-research--technology/public-review-drafts and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at www.ashrae.org/bookstore or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

This addendum updates the table 6.8.1-4 to make the following changes;

1. *Update the requirements for SPVAC <65,000 to the new DOE minimum efficiencies that go into effect on 9/23/2019*
2. *Add the requirements specified by DOE for off mode power consumption of air cooled <65,000 Btu/h single phase central air conditioners and heat pumps to table F-1 and added a new definition to chapter 3.*
3. *Move the requirements for room air conditioners for US sales to appendix F in a new table F-3 and update the requirements and metrics to the latest DOE values that went into effect on 6/1/2014.*
4. *Update the room air conditioner requirements in the table 6.8.1-4 and indicate they are only for sales outside the US. Used the same values as defined by DOE for US sales as shown in table F-3*
5. *Update the air cooled <65,000 Btu/h single phase central air conditioner and heat pump unit efficiencies in table F-1 to align with the DOE national efficiencies for this equipment category. This also includes conversion to the new SEER2, EER2 and HSPF2 metrics. The effective date for the new requirements is 1/1/2023 as specified by DOE requirements.*
6. *Add a new definitions for efficiency metrics for room air conditioners to chapter 3 (CEER for IP units and $CCOP_C$ for SI units) as specified in ANSI/AHAM RAC-1 2015 standard*
7. *Added the reference test procedure to table F-1 and to the new table F-3*

The economic justification for the more stringent efficiency levels for air-cooled <65K single phase, room air conditioners, and SPVAC <65,000 was addressed in the DOE rulemaking documents for the applicable energy conservation standards rulemakings

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by <u>underlining</u> (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum bn to 90.1-2016

Add the following new definitions to chapter 3

Combined Energy Efficiency Ratio (CEER); a ratio of the total cooling one year divided by the total energy from active, standby, and off modes (see $CCOP_C$ for SI equivalent) as specified in 10 CFR 430.23.

Combined Coefficient of Performance ($CCOP_C$); a ratio of the total cooling one year divided by the total energy from active, standby, and off modes (see CEER for IP equivalent).

Off-mode power consumption (P_{wOFF}); the power consumption when the unit is connected to its main power source but is neither providing cooling nor heating to the building it serves

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Replace table 6.8.1-4 IP with the revised table and move the Room Air Conditioner requirements to appendix F.

Table 6.8.1-4 Electrically Operated *Packaged Terminal Air Conditioners*, *Packaged Terminal Heat Pumps*, *Single-Package Vertical Air Conditioners*, *Single-Package Vertical Heat Pumps*, *Room Air Conditioners*, and Room Air Conditioner Heat Pumps—Minimum *Efficiency* Requirements

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum *Efficiency*	Test Procedure[a]
PTAC (cooling mode) standard size	All capacities	95°F db *outdoor air*	13.8 – (0.300 × Cap/1000)[c] (before 1/1/2015) 14.0 – (0.300 × Cap/1000)[c] (as of 1/1/2015)	AHRI 310/380
PTAC (cooling mode) nonstandard size[a]	All capacities	95°F db *outdoor air*	10.9 – (0.213 × Cap/1000)[c] *EER*	AHRI 310/380
PTHP (cooling mode) standard size	All capacities	95°F db *outdoor air*	14.0 – (0.300 × Cap/1000)[c]	AHRI 310/380
PTHP (cooling mode) nonstandard size[b]	All capacities	95°F db *outdoor air*	10.8 – (0.213 × Cap/1000)[c] *EER*	AHRI 310/380
PTHP (heating mode) standard size	All capacities		3.7 – (0.052 × Cap/1000)[c] COP_H	AHRI 310/380
PTHP (heating mode) nonstandard size[b]	All capacities		2.9 – (0.026 × Cap/1000)[c] COP_H	AHRI 310/380
SPVAC (cooling mode)	<65,000 Btu/h	95°F db/75°F wb *outdoor air*	10.0 *EER*	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 *EER*	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 *EER*	
SPVHP (cooling mode)	<65,000 Btu/h	95°F db/75°F wb *outdoor air*	10.0 *EER*	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 *EER*	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 *EER*	
SPVHP (heating mode)	<65,000 Btu/h	47°F db/43°F wb *outdoor air*	3.0 COP_H	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		3.0 COP_H	
	≥135,000 Btu/h and <240,000 Btu/h		3.0 COP_H	
Room air conditioners with louvered sides	<6000 Btu/h		9.7 *SEER*	ANSI/AHAM RAC-1
	≥6000 Btu/h and <8000 Btu/h		9.7 *SEER*	
	≥8000 Btu/h and <14,000 Btu/h		9.8 *EER*	
	≥14,000 Btu/h and <20,000 Btu/h		9.7 *SEER*	
	≥20,000 Btu/h		8.5 *EER*	
SPVAC (cooling mode), nonweatherized space constrained	≤30,000 Btu/h	95°F db/75°F wb *outdoor air*	9.2 *EER*	AHRI 390
	>30,000 Btu/h and≤36,000 Btu/h		9.0 *EER*	
SPVHP (cooling mode), nonweatherized space constrained	≤30,000 Btu/h	95°F db/75°F wb *outdoor air*	9.2 *EER*	AHRI 390
	>30,000 Btu/h and ≤36,000 Btu/h		9.0 *EER*	

SPVHP (heating mode), nonweatherized space constrained<	≤30,000 Btu/h	47°F db/43°F wb *outdoor air*	3.0 COP_H	AHRI 390
	>30,000 Btu/h and ≤36,000 Btu/h		3.0 COP_H	
Room air conditioners without louvered sides	<8000 Btu/h		9.0 *EER*	ANSI/AHAM RAC-1
	≥8000 Btu/h and <20,000 Btu/h		8.5 *EER*	
	≥20,000 Btu/h		8.5 *EER*	
Room air conditioner heat pumps with louvered sides	<20,000 Btu/h		9.0 *EER*	ANSI/AHAM RAC-1
	20,000 Btu/h		8.5 *EER*	
Room air conditioner heat pumps without louvered sides	<14,000 Btu/h		8.5 *EER*	ANSI/AHAM RAC-1
	≥14,000 Btu/h		8.0 *EER*	
Room air conditioner, casement only	All capacities		8.7 *EER*	ANSI/AHAM RAC-1
Room air conditioner, casement slider	All capacities		9.5 *EER*	ANSI/AHAM RAC-1

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

b. Nonstandard size units must be factory *labeled* as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external *wall* opening of less than 16 in. high or less than 42 in. wide and having a cross-sectional area less than 670 in^2.

c. "Cap" means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.

Insert the following revised IP table 6.8.1-4

Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps—Minimum Efficiency Requirements

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum *Efficiency*[d]	Test Procedure[a]
PTAC (cooling mode) standard size	<7,000 Btu/h	95°F db/75 °F wb *outdoor air*[c]	11.9 EER	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		14.0 – (0.300 × Cap/1000) EER	
	>15,000 Btu/h		9.50 EER	
PTAC (cooling mode) nonstandard size[a]	<7,000 Btu/h	95°F db/75 °F wb *outdoor air*[c]	9.40 EER	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		10.9 – (0.213 × Cap/1000) *EER*	
	>15,000 Btu/h		7.70 EER	
PTHP (cooling mode) standard size	<7,000 Btu/h	95°F db/75 °F wb *outdoor air*[c]	11.9 EER	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		14.0 – (0.300 × Cap/1000) EER	
	>15,000 Btu/h		9.50 EER	
PTHP (cooling mode) nonstandard size[b]	<7,000 Btu/h	95°F db/75 °F wb *outdoor air*[c]	9.30 EER	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		10.8 – (0.213 × Cap/1000) *EER*	
	>15,000 Btu/h		7.60 EER	
PTHP (heating mode) standard size	<7,000 Btu/h	47°F db/43°F wb *outdoor air*[c]	3.30 COP_H	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		3.7 – (0.052 × Cap/1000) COP_H	
	>15,000 Btu/h		2.90 COP_H	
PTHP (heating mode) nonstandard size[b]	<7,000 Btu/h	47°F db/43°F wb *outdoor air*[c]	2.70 COP_H	AHRI 310/380
	≥7,000 Btu/h and ≤15,000 Btu/h		2.9 – (0.026 × Cap/1000) COP_H	
	>15,000 Btu/h		2.50 COP_H	
SPVAC (cooling mode) Single and 3 phase	<65,000 Btu/h	95°F db/75°F wb *outdoor air*[c]	11.0 *EER*	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 *EER*	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 *EER*	
SPVHP (cooling mode)	<65,000 Btu/h	95°F db/75°F wb *outdoor air*[c]	11.0 *EER*	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 *EER*	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 *EER*	
SPVHP (heating mode)	<65,000 Btu/h	47°F db/43°F wb *outdoor air*[c]	3.30 COP_H	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		3.00 COP_H	
	≥135,000 Btu/h and <240,000 Btu/h		3.00 COP_H	
Room Air Conditioners without reverse cycle with louvered sides for sale outside US[d]	<6,000 Btu/h		11.0 *CEER*	ANSI/AHAM RAC-1
	≥6,000 and <8,000 Btu/h		11.0 *CEER*	
	8,000 and <14,000 Btu/h		10.9 *CEER*	

	14,000 and <20,000 Btu/h		10.7 *CEER*	
	≥20,000 and <28,000 Btu/h		9.4 *CEER*	
	≥28,000Btu/h		9.0 *CEER*	
Room Air Conditioners without reverse cycle without louvered sides for sale outside US[d]	<6,000 Btu/h		10.0 *CEER*	ANSI/AHAM RAC-1
	≥6,000 and <8,000 Btu/h		10.0 *CEER*	
	≥8,000 and <11,000 Btu/h		*9.6 CEER*	
	≥11,000 and <14,000 Btu/h		9.5 *CEER*	
	≥14,000 and <20,000 Btu/h		9.3 *CEER*3	
	≥20,000 Btu/h		9.4 *CEER*	
Room Air Conditioners with reverse cycle, with louvered sides for sale outside US[d]	<20,000 Btu/h		9.8 *CEER*	ANSI/AHAM RAC-1
	≥20,000 Btu/h		9.3 *CEER*	
Room Air Conditioners with reverse cycle without louvered sides for sale outside US[d]	<14,000 Btu/h		*9.3 CEER*	ANSI/AHAM RAC-1
	≥14,000 Btu/h		*8.7 CEER*	ANSI/AHAM RAC-1
Room Air Conditioners, casement only for sale outside US[d]	All		*9.5 CEER*	ANSI/AHAM RAC-1
Room Air Conditioners, casement slider for sale outside US[d]	All		*10.4 CEER*	ANSI/AHAM RAC-1

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

b. Nonstandard size units must be factory *labeled* as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external *wall* opening of less than 16 in. high or less than 42 in. wide and having a cross-sectional area less than 670 in^2.

c. The cooling-mode wet bulb temperature requirement only applies for units that reject condensate to the condenser coil.

d Room air conditioners are regulated as consumer products by the US Department of Energy at 10 CFR 430. For US sales of Room air conditioners, refer to appendix F table F-3 for the U.S. Department of Energy minimum efficiency requirements.

Update the efficiencies for DOE covered single phase products listed in table F-1. Also create a table F-3 to cover window units that have been moved from table 6.8.3-4.

Update the reference to the federal register in the text just in appendix F just before the figure F-1

Figure F-1 Map of the regions for the analysis of central air conditioners and heat pumps.
(Source: Federal Register 76 FR 37431, June ~~27, 2011~~ 7, 2018)

Delete existing table F-1 and replace with the revised table to reflect the latest DOE requirements

Table F-1 ~~U.S. Minimum *Efficiency* Requirements for Single-Phase Air Conditioners and Heat Pumps that Have a Cooling Capacity < 65,000 Btu/h~~

~~Product Class~~	~~National Standards~~	~~Southeastern Region Standards[b]~~	~~Southwestern Region Standards[c]~~
~~Central Air Conditioners and Heat Pumps[d]~~			
~~Split-*system* air conditioners~~	~~*SEER* = 13~~	~~*SEER* = 14~~	~~*SEER* = 14~~ ~~*EER* = 12.2 (for units with a rated cooling capacity less than 45,000 Btu/h)~~ ~~*EER* = 11.7 (for units with a rated cooling capacity equal to or greater than 45,000 Btu/h)~~
~~Split-*system* heat pumps~~	~~*SEER* = 14~~ ~~*HSPF* = 8.2~~	~~*SEER* = 14~~ ~~*HSPF* = 8.2~~	~~*SEER* = 14~~ ~~*HSPF* = 8.2~~
~~Split-*system* air conditioners[a]~~	~~*SEER* = 14~~	~~*SEER* = 14~~	~~*SEER* = 14~~ ~~*EER* = 11.0~~
~~Single-package heat pumps~~	~~*SEER* = 14~~ ~~*HSPF* = 8.0~~	~~*SEER* = 14~~ ~~*HSPF* = 8.0~~	~~*SEER* = 14~~ ~~*HSPF* = 8.0~~
~~Small-duct high-velocity *systems*~~	~~*SEER* = 13~~ ~~*HSPF* = 7.7~~	~~*SEER* = 13~~ ~~*HSPF* = 7.7~~	~~*SEER* = 13~~ ~~*HSPF* = 7.7~~
~~Space-constrained products—air conditioners[a]~~	~~*SEER* = 12~~	~~*SEER* = 12~~	~~*SEER* = 12~~
~~Space-constrained products—heat pumps[a]~~	~~*SEER* = 12~~ ~~*HSPF* = 7.4~~	~~*SEER* = 12~~ ~~*HSPF* = 7.4~~	~~*SEER* = 12~~ ~~*HSPF* = 7.4~~

~~a. The Northern region for central air conditioners and heat pumps contains the following States: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.~~

~~b. The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.~~

~~c. The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.~~

~~d. *SEER* is Seasonal *Energy Efficiency Ratio*; *EER* is *Energy Efficiency Ratio*; *HSPF* is *Heating Seasonal Performance Factor*; and Btu/h is British thermal units per hour.~~

Add the following replacement IP table

Table F-1 Minimum *Efficiency* Requirements Single-Phase Central Air Conditioners and Heat Pumps for sale in US

Product Class	Capacity Range	National Standards	Southeastern Region Standards[a]	Southwestern Region Standards[b]	Test Procedure[f]
Central Air Conditioners and Heat Pumps[cd]					
Split-System air conditioners for sale in the US	<45,000 Btu/h *single phase*	before 1/1/2023 *SEER* = 13.0 after 1/1/2023 SEER2 = 13.4 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 *SEER* = 14.0 after 1/1/2023 SEER2 = 14.3 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 SEER = 14.0 EER=12.2 after 1/1/2023 SEER2 = 14.3 EER2=11.7/9.8[d] $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Split-*system* air conditioners	≥45,000 and <65,000 Btu/h *single phase*	before 1/1/2023 *SEER* = 13.0 after 1/1/2023 SEER2 = 13.4 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 SEER = 14.0 after 1/1/2023 SEER2 = 13.8 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 SEER = 14.0 EER =11.7[d] after 1/1/2023 SEER2 = 13.8 EER2=11.2/9.8[e] $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Split-System heat pumps	<65,000 Btu/h single *phase*	before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.2 after 1/1/2023 SEER2=14.3 HSPF2= 7.5 $P_{w,OFF}$ ≤ 33 W	before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.2 after 1/1/2023 SEER2=14.3 HSPF2=7.5 $P_{w,OFF}$ ≤ 33 W	before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.2 after 1/1/2023 SEER2=14.3 HSPF2=7.5 $P_{w,OFF}$ ≤ 33 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Single-package air conditioners[a]	<65,000 Btu/h *single phase*	before 1/1/2023 *SEER* = 14.0 after 1/1/2023 SEER2=13.4 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 *SEER* = 14.0 after 1/1/2023 SEER2 =13.4 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 *SEER* = 14.0 *EER* = 11.0 after 1/1/2023 SEER2=13.4 EER2=10.6 $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Single-package heat pumps	<65,000 Btu/h *single phase*	Before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.0 after 1/1/2023 SEER2=13.4 HSPF2=6.7 $P_{w,OFF}$ ≤ 33 W	Before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.0 after 1/1/2023 SEER2=13.4 HSPF2=6.7 $P_{w,OFF}$ ≤ 33 W	Before 1/1/2023 *SEER* = 14.0 *HSPF* = 8.0 after 1/1/2023 SEER2=13.4 HSPF2=6.7 $P_{w,OFF}$ ≤ 33 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Small-duct high-velocity *systems*	<65,000 Btu/h *single phase*	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.2 After 1/1/2023 SEER2=12.0 HSPF2=6.1 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.2 After 1/1/2023 SEER2=11.7 HSPF2=6.1 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.2 After 1/1/2023 SEER2=12.0 HSPF2=6.1 $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023

Space-constrained products—air conditioners[a]	<65,000 Btu/h *single phase*	Before 1/1/2023 *SEER* = 12.0 After 1/1/2023 SEER2= 11.7 $P_{W,OFF} \leq 30$ W	Before 1/1/2023 *SEER* = 12.0 After 1/1/2023 SEER2= 11.7 $P_{W,OFF} \leq 30$ W	Before 1/1/2023 *SEER* = 12.0 After 1/1/2023 SEER2= 11.7 $P_{W,OFF} \leq 30$ W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Space-constrained products—heat pumps[a]	<65,000 Btu/h *single phase*	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.4 After 1/1/2023 *SEER2* = 11.9 *HSPF2* = 6.3 $P_{W,OFF} \leq 33$ W	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.4 After 1/1/2023 *SEER2* = 11.9 *HSPF2* = 6.3 $P_{W,OFF} \leq 33$ W	Before 1/1/2023 *SEER* = 12.0 *HSPF* = 7.4 After 1/1/2023 *SEER2* = 11.9 *HSPF2* = 6.3 $P_{W,OFF} \leq 33$ W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023

a. The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.

b. The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.

c. SEER is Seasonal Energy Efficiency Ratio; EER is Energy Efficiency Ratio; HSPF is Heating Seasonal Performance Factor; and Btu/h is British thermal units per hour. SEER2 is Seasonal Energy Efficiency Ratio reflecting the new higher static that is effective 1/1/2023; EER2 is Energy Efficiency Ratio also reflecting the higher static; HSPF2 is new Heating Seasonal Performance Factor reflecting the new higher static and load line. Test and rating procedure defined in AHRI 210/240-2017 for EER, SEER and HSPF and AHRI210/240 for EER2, SEER2 and HSPF2

d The 11.7 EER2 standard applies to products with a certified SEER2 less than 15.2. The 9.8 EER2 standard applies to products with a certified SEER2 greater than or equal to 15.2.

e The 11.2 EER2 standard applies to products with a certified SEER2 less than 15.2. The 9.8 EER2 standard applies to products with a certified SEER2 greater than or equal to 15.2.

f Section 12 contains a complete specification of the referenced test procedures, including the referenced year version of the test procedure

Add the new IP table F-3 to show the latest DOE efficiencies for Room air conditioners

Table F-3 Minimum *Efficiency* Requirements for Room Air Conditioners for Sale in US.

Product Class	Capacity Range	Efficiency Requirements[a,]	Test Procedure[b]
Room Air Conditioners without reverse cycle with louvered sides	<6,000 Btu/h	*CEER*= 11.0	10 CFR 430 Appendix F
	≥6,000 and <8,000 Btu/h	*CEER*= 11.0	
	≥8,000 and <14,000 Btu/h	*CEER*= 10.9	
	≥14,000 and <20,000 Btu/h	*CEER*= 10.7	
	≥20,000 and <28,000 Btu/h	*CEER*= 9.4	
	≥28,000	*CEER*= 9.0	
Room Air Conditioners without reverse cycle without louvered sides	<6,000 Btu/h	*CEER*=10.0	10 CFR 430 Appendix F
	≥6,000 and <8,000 Btu/h	*CEER*=10.0	
	≥8,000 and <11,000 Btu/h	*CEER*=9.6	
	≥11,000 and <14,000 Btu/h	*CEER*=9.5	
	≥14,000 and <20,000 Btu/h	*CEER*=9.3	
	≥20,000 Btu/h	*CEER*=9.4	
Room Air Conditioners with reverse cycle, with louvered sides	<20,000 Btu/h	*CEER*=9.8	10 CFR 430 Appendix F
	≥20,000 Btu/h	*CEER*=9.3	
Room Air Conditioners with reverse cycle without louvered sides	<14,000 Btu/h	*CEER*=9.3	10 CFR 430 Appendix F
	≥14,000 Btu/h	*CEER*=8.7	
Room Air Conditioners, casement only	All	*CEER*=9.5	10 CFR 430 Appendix F
Room Air Conditioners, casement slider	All	*CEER*=10.4	10 CFR 430 Appendix F

a. Source: Federal Register 76 FR 37431, June 27, 2011
b. Section 12 contains a complete specification of the referenced test procedures,

Replace table 6.8.1-4 SI with the revised table and move the requirements for Window Air Conditioner sold in the US to appendix F.

Table 6.8.1-4 Electrically Operated *Packaged Terminal Air Conditioners*, *Packaged Terminal Heat Pumps*, *Single-Package Vertical Air Conditioners*, *Single-Package Vertical Heat Pumps*, *Room Air Conditioners*, and Room Air Conditioner Heat Pumps—Minimum *Efficiency* Requirements

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum *Efficiency*	Test Procedure[a]
PTAC (cooling mode) standard size	All capacities	35.0°C db *outdoor air*	4.04 – (0.300 × Cap/1000)[e] COP_C (before 1/1/2015) 4.10 – (0.300 × Cap/1000)[e] COP_C (as of 1/1/2015)	AHRI 310/380
PTAC (cooling mode) nonstandard size[a]	All capacities	35.0°C db *outdoor air*	3.19 – (0.213 × Cap/1000)[e] COP_C	AHRI 310/380
PTHP (cooling mode) standard size	All capacities	35.0°C db *outdoor air*	4.10 – (0.300 × Cap/1000)[e]	AHRI 310/380
PTHP (cooling mode) nonstandard size[b]	All capacities	35.0°C db *outdoor air*	3.16 – (0.213 × Cap/1000)[e] COP_C	AHRI 310/380
PTHP (heating mode) standard size	All capacities		3.7 – (0.052 × Cap/1000)[e] COP_H	AHRI 310/380
PTHP (heating mode) nonstandard size[b]	All capacities		2.9 – (0.026 × Cap/1000)[e] COP_H	AHRI 310/380
SPVAC (cooling mode)	<19 kW	35.0°C db/23.9°C wb *outdoor air*	2.93 COP_C	AHRI 390
	≥19 kW and <40 kW		2.93 COP_C	
	≥40 kW and <70 kW		2.93 COP_C	
SPVHP (cooling mode)	<19 kW	35.0°C db/23.9°C wb *outdoor air*	2.64 COP_C	AHRI 390
	≥19 kW and <40 kW		2.64 COP_C	
	≥40 kW and <70 kW		2.64 COP_C	
SPVHP (heating mode)	<19 kW	8.3°C db/6.1°C wb *outdoor air*	3.0 COP_H	AHRI 390
	≥19 kW and <40 kW		3.0 COP_H	
	≥40 kW and <70 kW		3.0 COP_H	
Room air conditioners with louvered sides	<1.8 kW		2.84 COP_C	ANSI/AHAM RAC-1
	≥1.8 kW and <2.3 kW		2.84 COP_C	
	≥2.3 kW and <4.1 kW		2.87 COP_C	
	≥4.1 kW and <5.9 kW		2.84 COP_C	
	≥5.9 kW		2.49 COP_C	
SPVAC (cooling mode), nonweatherized space constrained	≤9 kW	95°C db/23.9°C wb *outdoor air*	2.69 COP_C	AHRI 390
	>9 kW and≤11 kW		2.64 COP_C	
SPVHP (cooling mode), nonweatherized space constrained	≤9 kW	95°C db/23.9°C wb *outdoor air*	2.69 COP_C	AHRI 390
	>9 kW and≤11 kW		2.64 COP_C	
SPVHP (heating mode),	≤9 kW	8.3°C db/6.1°C wb	3.0 COP_H	AHRI 390

~~nonweatherized space constrained~~	~~>9 kW and ≤11 kW~~	~~*outdoor air*~~	~~3.0 COP_H~~	
~~*Room air conditioners* without louvered sides~~	~~<2.3 kW~~		~~2.64 COP_C~~	~~ANSI/AHAM RAC-1~~
	~~≥2.3 kW and <5.9 kW~~		~~2.49 COP_C~~	
	~~≥5.9 kW~~		~~2.49 COP_C~~	
~~Room air conditioner heat pumps with louvered sides~~	~~<5.9 kW~~		~~2.65 COP_C~~	~~ANSI/AHAM RAC-1~~
	~~>5.9 kW~~		~~2.49 COP_C~~	
~~Room air conditioner heat pumps without louvered sides~~	~~<4.1 kW~~		~~2.49 COP_C~~	~~ANSI/AHAM RAC-1~~
	~~≥4.1 kW~~		~~2.34 COP_C~~	
~~*Room air conditioner*, casement only~~	~~All capacities~~		~~2.55 COP_C~~	~~ANSI/AHAM RAC-1~~
~~*Room air conditioner*, casement slider~~	~~All capacities~~		~~2.78 COP_C~~	~~ANSI/AHAM RAC-1~~

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
b. Nonstandard size units must be factory *labeled* as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external *wall* opening of less than 0.45 m high or less than 1.0 m wide and having a cross-sectional area less than 0.4 m^2.
c. "Cap" means the rated cooling capacity of the product in *kW*. If the unit's capacity is less than 2.1 *kW*, use 2.1 *kW* in the calculation. If the unit's capacity is greater than 4.4 *kW*, use 4.4 *kW* in the calculation.

Insert the following replacement SI table 6.8.1-4

Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps—Minimum Efficiency Requirements

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure[a]
PTAC (cooling mode) standard size	<2.1 kW	35°C db/23.9 °C wb *outdoor air*[c]	3.49 COP_C	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		4.10 – (0.290 × Cap) COP_C	
	>4.4 kW		2.78 COP_C	
PTAC (cooling mode) nonstandard size[a]	<2.1 kW	35°C db/23.9 °C wb *outdoor air*[c]	2.75 COP_C	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		3.19 – (0.206 × Cap) COP_C	
	>4.4 kW		2.26 COP_C	
PTHP (cooling mode) standard size	<2.1 kW	35°C db/23.9 °C wb *outdoor air*[c]	3.49 COP_C	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		4.100 – (0.290 × Cap) COP_C	
	>4.4 kW		2.78 COP_C	
PTHP (cooling mode) nonstandard size[b]	<2.1 kW	35°C db/23.9 °C wb *outdoor air*[c]	2.73 COP_C	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		3.17 – (0.206 × Cap) COP_C	
	>4.4 kW		2.23 COP_C	
PTHP (heating mode) standard size	<2.1 kW	8.3°C db/6.1 °C wb *outdoor air*[c]	3.30 COP_H	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		3.7 – (0.050 × Cap) COP_H	
	>4.4 kW		2.90 COP_H	
PTHP (heating mode) nonstandard size[b]	<2.1 kW	8.3°C db/6.1 °C wb *outdoor air*[c]	2.70 COP_H	AHRI 310/380
	≥2.1 kW and ≤4.4 kW		2.9 – (0.025 × Cap) COP_H	
	>4.4 kW		2.50 COP_H	
SPVAC (cooling mode) Single and 3 phase	<19 kW	35°C db/23.9°C wb *outdoor air*[c]	3.22 COP_C	AHRI 390
	≥19 kW and <40 kW		2.93 COP_C	
	≥40 kW and <70 kW		2.93 COP_C	
SPVHP (cooling mode)	<19 kW	35°C db/23.9°C wb *outdoor air*[c]	3.22 COP_C	AHRI 390
	≥19 kW and <40 kW		2.93 COP_C	
	≥40 kW and <70 kW		3.22 COP_C	
SPVHP (heating mode)	<19 kW	8.3°C db/6.1°C wb *outdoor air*[c]	3.3 COP_H	AHRI 390
	≥19 kW and <40 kW		3.0 COP_H	
	≥40 kW and <70 kW		3.0 COP_H	
Room Air Conditioners without reverse cycle with louvered sides for sale outside the US[d]	<1.8 kW		$CCOP_C$ = 3.22	ANSI/AHAM RAC-1
	≥1.8 and <2.3 kW		$CCOP_C$ = 3.19	
	≥2.3 and <4.1 kW		$CCOP_C$ = 3.19	
	≥4.1 and <5.9 kW		$CCOP_C$ = 3.14	

	≥5.9 kW and <8.2 kW		$CCOP_C$ = 2.75	
	≥8.2 kW		$CCOP_C$ = 2.64	
Room Air Conditioners without reverse cycle without louvered sides for sale outside the US[d]	<1.8 KW		$CCOP_C$ =2.93	ANSI/AHAM RAC-1
	≥1.8 and <2.3 KW		$CCOP_C$ =2.93	
	≥2.3 and <3.2 KW		$CCOP_C$ =2.81	
	≥3.2 and <3.2 KW		$CCOP_C$ =2.78	
	≥4.1 and <5.9 KW		$CCOP_C$ =2.73	
	≥5.9 KW		$CCOP_C$ =2.75	
Room Air Conditioners with reverse cycle, with louvered sides for sale outside the US[d]	<5.9 KW		$CCOP_C$ =*2.87*	ANSI/AHAM RAC-1
	≥5.9 KW		$CCOP_C$ =*2.73*	
Room Air Conditioners with reverse cycle without louvered sides for sale outside the US[d]	<4.1 KW		$CCOP_C$ =*2.73*	ANSI/AHAM RAC-1
	≥4.1 KW		$CCOP_C$ =*2.55*	ANSI/AHAM RAC-1
Room Air Conditioners, casement only for sale outside the US[d]	All		$CCOP_C$ =*2.78*	ANSI/AHAM RAC-1
Room Air Conditioners, casement slider for sale outside the US[d]	All		$CCOP_C$ =*3.05*	ANSI/AHAM RAC-1

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

b. Nonstandard size units must be factory *labeled* as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external *wall* opening of less than 0.45 m. high or less than 1.0 m. wide and having a cross-sectional area less than 0.4 m^2.

c. The cooling mode wet bulb temperature requirement only applies for units that reject condensate to the condenser coil.

d Room air conditioners are regulated as consumer products by the US Department of Energy at 10 CFR 430. For US sales of room air conditioners, refer to appendix F table F-3 for the U.S. Department of Energy minimum efficiency requirements.

Update the efficiency requirements in table F-1 the revised single phase air conditioner requirements to reflect the DOE approved efficiencies. Note that the current table in the published version of ASHRAE 90.1-2016 incorrectly shows the metrics in IP units so the complete table should be replaced with the revised table

Table F-1 U.S. Minimum *Efficiency* Requirements for Single-Phase Air Conditioners and Heat Pumps that Have a Cooling Capacity < 19kW

Product Class	National Standards	Southeastern Region Standards[b]	Southwestern Region Standards[c]
Central Air Conditioners and Heat Pumps[d]			
Split-*system* air conditioners	*SEER* = 13	*SEER* = 14	*SEER* = 14 *EER* = 12.2 (for units with a rated cooling capacity less than 45,000 Btu/h) *EER* = 11.7 (for units with a rated cooling capacity equal to or greater than 45,000 Btu/h)
Split-*system* heat pumps	*SEER* = 14 *HSPF* = 8.2	*SEER* = 14 *HSPF* = 8.2	*SEER* = 14 *HSPF* = 8.2
Split-*system* air conditioners[a]	*SEER* = 14	*SEER* = 14	*SEER* = 14 *EER* = 11.0
Single-package heat pumps	*SEER* = 14 *HSPF* = 8.0	*SEER* = 14 *HSPF* = 8.0	*SEER* = 14 *HSPF* = 8.0
Small-duct high-velocity *systems*	*SEER* = 13 *HSPF* = 7.7	*SEER* = 13 *HSPF* = 7.7	*SEER* = 13 *HSPF* = 7.7
Space-constrained products—air conditioners[a]	*SEER* = 12	*SEER* = 12	*SEER* = 12
Space-constrained products—heat pumps[a]	*SEER* = 12 *HSPF* = 7.4	*SEER* = 12 *HSPF* = 7.4	*SEER* = 12 *HSPF* = 7.4

a. The Northern region for central air conditioners and heat pumps contains the following States: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

b. The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.

c. The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.

d. SEER is Seasonal Energy Efficiency Ratio; EER is Energy Efficiency Ratio; HSPF is Heating Seasonal Performance Factor; and Btu/h is British thermal units per hour. Test and rating procedure defined in AHRI 210/240

Insert the revised table F-1 in the SI Standard

Table F-1 Minimum *Efficiency* Requirements for Single-Phase Central Air Conditioners and Heat Pumps sold in the US.

Product Class	Capacity Range	National Standards	Southeastern Region Standards[a]	Southwestern Region Standards[b]	Test Procedure[f]
Central Air Conditioners and Heat Pumps[cd]					
Split-system air conditioners	<13 kW *single phase*	before 1/1/2023 $SCOP_C$ = 3.81 after 1/1/2023 $SCOP2_C$ =3.93 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 $SCOP_C$ = 4.10 after 1/1/2023 $SCOP2_C$ = 4.19 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 SCOPc = 4.10 COP_C=3.58 after 1/1/2023 SCOPc = 4.19 $COP2_C$=3.43/2.87[d] $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Split-*system* air conditioners	≥13 kW *and* <19 kW *single phase*	before 1/1/2023 $SCOP_C$ = 3.81 after 1/1/2023 $SCOP2_C$ =3.93 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 $SCOP_C$ = 4.10 after 1/1/2023 $SCOP2_C$ = 4.19 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 SCOPc = 4.10 COP_C =3.43[d] after 1/1/2023 $SCOP2_C$=4.04 $COP2_C$ =3.2.8/2.87[d] $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Split-System heat pumps	<19 kW *single phase*	before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.40 after 1/1/2023 $SCOP2_C$ =4.19 $SCOP2_H$= 2.20 $P_{w,OFF}$ ≤ 33 W	before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.40 after 1/1/2023 $SCOP2_C$ =4.19 $SCOP2_H$=2.20 $P_{w,OFF}$ ≤ 33 W	before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.40 after 1/1/2023 $SCOP2_C$ =4.19 $SCOP2_H$=2.20 $P_{w,OFF}$ ≤ 33 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Single-Package air conditioners[a]	<19 kW *single phase*	before 1/1/2023 $SCOP_C$ = 4.10 after 1/1/2023 $SCOP2_C$ =3.93 $P_{w,OFF}$ ≤ 30 W	before 1/1/2023 $SCOP_C$ = 4.10 after 1/1/2023 $SCOP2_C$ =3.93 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 $SCOP_C$ = 4.10 COP_C = 3.22 after 1/1/2023 $SCOP2_C$ =3.93 $COP2_C$ =3.11 $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Single-package heat pumps	<19 kW *single phase*	Before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.34 after 1/1/2023 $SCOP2_C$ =3.93 $SCOP2_H$=1.96 $P_{w,OFF}$ ≤ 33 W	Before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.34 after 1/1/2023 $SCOP2_C$ =3.93 $SCOP2_H$=1.96 $P_{w,OFF}$ ≤ 33 W	Before 1/1/2023 $SCOP_C$ = 4.10 $SCOP_H$ = 2.34 after 1/1/2023 $SCOP2_C$ =3.93 $SCOP2_H$ =1.96 $P_{w,OFF}$ ≤ 33 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Small-duct high-velocity *systems*	<19 kW *single phase*	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.11 After 1/1/2023 $SCOP2_C$ =3.52 $SCOP2_H$ =1.79 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.11 After 1/1/2023 $SCOP2_C$ =3.52 $SCOP2_H$ =1.79 $P_{w,OFF}$ ≤ 30 W	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.11 After 1/1/2023 $SCOP2_C$ =3.52 $SCOP2_H$ =1.79 $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023
Space-constrained products—air conditioners[a]	<19 kW *single phase*	Before 1/1/2023 $SCOP_C$ = 3.52 After 1/1/2023 $SCOP_C2$ = 3.43 $P_{w,OFF}$≤ 30 W	Before 1/1/2023 $SCOP_C$ = 3.52 After 1/1/2023 $SCOP_C$ = 3.43 $P_{w,OFF}$ ≤ 30 W	*Before 1/1/2023* $SCOP_C$ = 3.52 After 1/1/2023 $SCOP2_C$ = 3.43 $P_{w,OFF}$ ≤ 30 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023

Space-constrained products—heat pumps[a]	*<19 kW single phase*	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.17 After 1/1/2023 $SCOP2_C$ = 3.49 $SCOP2_H$ = 1.85 $P_{W,OFF}$ ≤ 33 W	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.17 After 1/1/2023 $SCOP2_C$ = 3.49 $SCOP2_H$ = 6.3 $P_{W,OFF}$ ≤ 33 W	Before 1/1/2023 $SCOP_C$ = 3.52 $SCOP_H$ = 2.17 After 1/1/2023 $SCOP2_C$ = 3.49 $SCOP2_H$ = 1.85 $P_{W,OFF}$ ≤ 33 W	AHRI 210/240-2017 before 1/1/2023 AHRI 210/240-2023 after 1/1/2023

a. The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.

b. The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.

c. $SCOP_C$ is the metric version in W/W for the SEER is Seasonal Energy Efficiency Ratio; COP_C is the full load Efficiency which is the metric version of EER in W/W; $SCOP_H$ is the metric version in W/W of HSPF is Heating Seasonal Performance Factor. $SCOP2_C$ is the metric version in W/W for the SEER2 Seasonal Energy Efficiency Ratio; $COP2_C$ is the full load Efficiency which is the metric version in W/W of EER2; $SCOP2_H$ is the metric version in W/W of HSPF2 which is Heating Seasonal Performance Factor. Test and rating procedures are defined in 10 CFR 430 Appendix M for EER, SEER, and HSPF and 10 CFR 430 Appendix M1 for EER2, SEER2 and HSPF2. The added "2" in the metric names reflects the new higher static (all metrics) and load line (HSPF2/$SCOP2_H$ only) for the new metrics effective in 1/1/2023.

d The 3.43 $COP2_C$ standard applies to products with a certified $SCOP2_C$ less than 4.45. The 2.87 $COP2_C$ standard applies to products with a certified $SCOP2_C$ greater than or equal to 4.45.

e The 3.28 $COP2_C$ standard applies to products with a certified $SCOP2_C$ less than 4.45. The 9.8 $COP2_C$ standard applies to products with a certified $SCOP2_C$ greater than or equal to 4.45.

f Section 12 contains a complete specification of the referenced test procedures, including the referenced year version of the test procedure

Add table F-3 to the SI version for the Room Air Conditioner Requirements that were moved and update from table 6.8.1-4

Table F-3 Minimum *Efficiency* Requirements for Room Air Conditioners.

Product Class	Capacity Range	Efficiency Requirements[a]	Test Procedure[b]
Room Air Conditioners without reverse cycle with louvered sides	<1.8 kW	*CCOP*$_C$= 3.22	10 CFR 430 Appendix F
	≥1.8 and <2.3 kW	*CCOP*$_C$ = 3.19	
	≥2.3 and <4.1 kW	*CCOP*$_C$ = 3.19	
	≥4.1 and <5.9 kW	*CCOP*$_C$ = 3.14	
	≥5.9 kW and <8.2 kW	*CCOP*$_C$ = 2.75	
	≥8.2 kW	*CCOP*$_C$ = 2.64	
Room Air Conditioners without reverse cycle without louvered sides	<1.8 KW	*CCOP*$_C$ =2.93	10 CFR 430 Appendix F
	≥1.8 and <2.3 KW	*CCOP*$_C$ =2.93	
	≥2.3 and <3.2 KW	*CCOP*$_C$ =2.81	
	≥3.2 and <3.2 KW	*CCOP*$_C$ =2.78	
	≥4.1 and <5.9 KW	*CCOP*$_C$ =2.73	
	≥5.9 KW	*CCOP*$_C$ =2.75	
Room Air Conditioners with reverse cycle, with louvered sides	<5.9 KW	*CCOP*$_C$ =2.87	10 CFR 430 Appendix F
	≥5.9 KW	*CCOP*$_C$ =2.73	
Room Air Conditioners with reverse cycle without louvered sides	<4.1 KW	*CCOP*$_C$ =2.73	10 CFR 430 Appendix F
Room Air Conditioners with reverse cycle	≥4.1 KW	*CCOP*$_C$ *=2.55*	10 CFR 430 Appendix F
Room Air Conditioners, casement only	All	*CCOP*$_C$ =2.78	10 CFR 430 Appendix F
Room Air Conditioners, casement slider	All	*CCOP*$_C$ =3.05	10 CFR 430 Appendix F

a. Source: Federal Register 76 FR 37431, June 27, 2011
b. Section 12 contains a complete specification of the referenced test procedures,