

§ 431.97

10 CFR Ch. II (1–1–23 Edition)

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ENERGY EFFICIENCY STANDARDS

§ 431.97 Energy efficiency standards and their compliance dates.

(a) All basic models of commercial package air-conditioning and heating equipment must be tested for performance using the applicable DOE test procedure in § 431.96, be compliant with the applicable standards set forth in paragraphs (b) through (f) of this section, and be certified to the Department under 10 CFR part 429.

(b) Each commercial air conditioner or heat pump (not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, and variable refrigerant flow systems) manufactured starting on the compliance date listed in the corresponding table must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1 through 6 of this section.

TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY STANDARDS FOR AIR CONDITIONING AND HEATING EQUIPMENT

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System).	<65,000 Btu/h .....	AC	All .....	SEER = 13	June 16, 2008.
		HP	All .....	SEER = 13	June 16, 2008. <sup>1</sup>
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Pack-age).	<65,000 Btu/h .....	AC	All .....	SEER = 13	June 16, 2008. <sup>1</sup>
		HP	All .....	SEER = 13	June 16, 2008. <sup>1</sup>
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled).	≥65,000 Btu/h and <135,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	SEER = 13	June 16, 2008. <sup>1</sup>
			All Other Types of Heating.	EER = 11.2	January 1, 2010. <sup>2</sup>
		HP	No Heating or Electric Resistance Heating.	EER = 11.0	January 1, 2010. <sup>2</sup>
			All Other Types of Heating.	EER = 11.0	January 1, 2010. <sup>2</sup>
Large Commercial Package Air Conditioning and Heating Equipment (Air-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 10.8	January 1, 2010. <sup>2</sup>
			All Other Types of Heating.	EER = 11.0	January 1, 2010. <sup>2</sup>
		HP	No Heating or Electric Resistance Heating.	EER = 10.8	January 1, 2010. <sup>2</sup>
			All Other Types of Heating.	EER = 10.6	January 1, 2010. <sup>2</sup>
Very Large Commercial Package Air Conditioning and Heating Equipment (Air-Cooled).	≥240,000 Btu/h and <760,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 10.4	January 1, 2010. <sup>2</sup>
			All Other Types of Heating.	EER = 10.0	January 1, 2010. <sup>2</sup>
		HP	No Heating or Electric Resistance Heating.	EER = 9.8 ...	January 1, 2010. <sup>2</sup>
			All Other Types of Heating.	EER = 9.5 ...	January 1, 2010. <sup>2</sup>
Small Commercial Package Air Conditioning and Heating Equipment (Water-Cooled).	<65,000 Btu/h .....	AC	All .....	EER = 9.3 ...	January 1, 2010. <sup>2</sup>
		AC	All .....	EER = 12.1	October 29, 2003.
	≥65,000 Btu/h and <135,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 12.1	June 1, 2013.

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TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY STANDARDS FOR AIR CONDITIONING AND HEATING EQUIPMENT—Continued

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Large Commercial Package Air-Conditioning and Heating Equipment (Water-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	AC	All Other Types of Heating. No Heating or Electric Resistance Heating. All Other Types of Heating.	EER = 11.9 EER = 12.5 EER = 12.3	June 1, 2013. June 1, 2014. June 1, 2014.
Very Large Commercial Package Air-Conditioning and Heating Equipment (Water-Cooled).	≥240,000 Btu/h and <760,000 Btu/h.	AC	No Heating or Electric Resistance Heating. All Other Types of Heating.	EER = 12.4 EER = 12.2	June 1, 2014. June 1, 2014.
Small Commercial Package Air-Conditioning and Heating Equipment (Evaporatively-Cooled).	<65,000 Btu/h . . . . .	AC	All . . . . .	EER = 12.1	October 29, 2003.
.....	≥65,000 Btu/h and <135,000 Btu/h.	AC	No Heating or Electric Resistance Heating. All Other Types of Heating.	EER = 12.1 EER = 11.9	June 1, 2013. June 1, 2013.
Large Commercial Package Air-Conditioning and Heating Equipment (Evaporatively-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	AC	No Heating or Electric Resistance Heating. All Other Types of Heating.	EER = 12.0 EER = 11.8	June 1, 2014. June 1, 2014.
Very Large Commercial Package Air-Conditioning and Heating Equipment (Evaporatively-Cooled).	≥240,000 Btu/h and <760,000 Btu/h.	AC	No Heating or Electric Resistance Heating. All Other Types of Heating.	EER = 11.9 EER = 11.7	June 1, 2014. June 1, 2014.
Small Commercial Package Air-Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop).	<17,000 Btu/h . . . . .	HP	All . . . . .	EER = 11.2	October 29, 2003. <sup>3</sup>
.....	≥17,000 Btu/h and <65,000 Btu/h.	HP	All . . . . .	EER = 12.0	October 29, 2003. <sup>3</sup>
.....	≥65,000 Btu/h and <135,000 Btu/h.	HP	All . . . . .	EER = 12.0	October 29, 2003. <sup>3</sup>

<sup>1</sup> And manufactured before January 1, 2017. See Table 3 of this section for updated efficiency standards.

<sup>2</sup> And manufactured before January 1, 2018. See Table 3 of this section for updated efficiency standards.

<sup>3</sup> And manufactured before October 9, 2015. See Table 3 of this section for updated efficiency standards.

TABLE 2 TO § 431.97—MINIMUM HEATING EFFICIENCY STANDARDS FOR AIR CONDITIONING AND HEATING EQUIPMENT [HEAT PUMPS]

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System).	<65,000 Btu/h . . . . .	HSPF = 7.7 . . . . .	June 16, 2008. <sup>1</sup>
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Package).	<65,000 Btu/h . . . . .	HSPF = 7.7 . . . . .	June 16, 2008. <sup>1</sup>
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled).	≥65,000 Btu/h and <135,000 Btu/h.	COP = 3.3 . . . . .	January 1, 2010. <sup>2</sup>
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	COP = 3.2 . . . . .	January 1, 2010. <sup>2</sup>
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥240,000 Btu/h and <760,000 Btu/h.	COP = 3.2 . . . . .	January 1, 2010. <sup>2</sup>

TABLE 2 TO § 431.97—MINIMUM HEATING EFFICIENCY STANDARDS FOR AIR CONDITIONING AND HEATING EQUIPMENT [HEAT PUMPS]—Continued

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Packaged Air Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop).	<135,000 Btu/h .....	COP = 4.2 .....	October 29, 2003. <sup>3</sup>

<sup>1</sup> And manufactured before January 1, 2017. See Table 4 of this section for updated heating efficiency standards.

<sup>2</sup> And manufactured before January 1, 2018. See Table 4 of this section for updated heating efficiency standards.

<sup>3</sup> And manufactured before October 9, 2015. See Table 4 of this section for updated heating efficiency standards.

TABLE 3 TO § 431.97—UPDATES TO THE MINIMUM COOLING EFFICIENCY STANDARDS FOR AIR CONDITIONING AND HEATING EQUIPMENT

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥65,000 Btu/h and <135,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	IEER = 12.9 IEER = 14.8	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 12.7 IEER = 14.6	January 1, 2018. <sup>1</sup> January 1, 2023.
		HP ..	Electric Resistance Heating or No Heating.	IEER = 12.2 IEER = 14.1	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 12.0 IEER = 13.9	January 1, 2018. <sup>1</sup> January 1, 2023.
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	IEER = 12.4 IEER = 14.2	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 12.2 IEER = 14.0	January 1, 2018. <sup>1</sup> January 1, 2023.
		HP ..	Electric Resistance Heating or No Heating.	IEER = 11.6 IEER = 13.5	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 11.4 IEER = 13.3	January 1, 2018. <sup>1</sup> January 1, 2023.
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥240,000 Btu/h and <760,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	IEER = 11.6 IEER = 13.2	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 11.4 IEER = 13.0	January 1, 2018. <sup>1</sup> January 1, 2023.
		HP ..	Electric Resistance Heating or No Heating.	IEER = 10.6 IEER = 12.5	January 1, 2018. <sup>1</sup> January 1, 2023.
			All Other Types of Heating.	IEER = 10.4 IEER = 12.3	January 1, 2018. <sup>1</sup> January 1, 2023.
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System).	<65,000 Btu/h .....	AC ..	All .....	SEER = 13.0	June 16, 2008.
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Package).	<65,000 Btu/h .....	HP ..	All .....	SEER = 14.0	January 1, 2017.
		AC ..	All .....	SEER = 14.0	January 1, 2017.
Small Commercial Packaged Air-Conditioning and Heating Equipment (Water Source: Water-to-Air, Water-Loop).	<17,000 Btu/h .....	HP ..	All .....	SEER = 14.0	January 1, 2017.
		HP ..	All .....	EER = 12.2	October 9, 2015.
	≥17,000 Btu/h and <65,000 Btu/h.	HP ..	All .....	EER = 13.0	October 9, 2015.

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TABLE 3 TO § 431.97—UPDATES TO THE MINIMUM COOLING EFFICIENCY STANDARDS FOR AIR  
CONDITIONING AND HEATING EQUIPMENT—Continued

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
	≥65,000 Btu/h and <135,000Btu/h.	HP ..	All .....	EER = 13.0	October 9, 2015.

<sup>1</sup> And manufactured before January 1, 2023.

TABLE 4 TO § 431.97—UPDATES TO THE MINIMUM HEATING EFFICIENCY STANDARDS FOR AIR-  
COOLED AIR CONDITIONING AND HEATING EQUIPMENT [HEAT PUMPS]

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow multi-split air conditioners and heat pumps, and double-duct air-cooled commercial package air conditioning and heating equipment]

Equipment type	Cooling capacity	Efficiency level. <sup>1</sup>	Compliance date: Equipment manufactured starting on . . .
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System).	<65,000 Btu/h .....	HSPF = 8.2 .....	January 1, 2017.
Small Commercial Package Air Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single Package).	<65,000 Btu/h .....	HSPF = 8.0 .....	January 1, 2017.
Small Commercial Package Air Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop).	<135,000 Btu/h .....	COP = 4.3 .....	October 9, 2015.
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥65,000 Btu/h and <135,000 Btu/h .....	COP = 3.3 .....	January 1, 2018. <sup>2</sup>
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥135,000 Btu/h and <240,000 Btu/h .....	COP = 3.4 .....	January 1, 2023.
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥240,000 Btu/h and <760,000 Btu/h .....	COP = 3.2 .....	January 1, 2018. <sup>2</sup>
		COP = 3.3 .....	January 1, 2023.
		COP = 3.2 .....	January 1, 2018.

<sup>1</sup> For units tested using the relevant AHRI Standards, all COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled equipment.

<sup>2</sup> And manufactured before January 1, 2023.

TABLE 5 TO § 431.97—MINIMUM COOLING EFFICIENCY STANDARDS FOR DOUBLE-DUCT AIR-  
CONDITIONING AND HEATING EQUIPMENT

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
Small Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥65,000 Btu/h and <135,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	EER = 11.2	January 1, 2010.
			All Other Types of Heating	EER = 11.0	January 1, 2010.
		HP ..	Electric Resistance Heating or No Heating.	EER = 11.0	January 1, 2010.
			All Other Types of Heating.	EER = 10.8	January 1, 2010.
Large Commercial Double-Duct Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥135,000 Btu/h and <240,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	EER = 11.0	January 1, 2010.
			All Other Types of Heating.	EER = 10.8	January 1, 2010.
		HP ..	Electric Resistance Heating or No Heating.	EER = 10.6	January 1, 2010.
			All Other Types of Heating.	EER = 10.4	January 1, 2010.
Very Large Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled).	≥240,000 Btu/h and <300,000 Btu/h.	AC ..	Electric Resistance Heating or No Heating.	EER = 10.0	January 1, 2010.

TABLE 5 TO § 431.97—MINIMUM COOLING EFFICIENCY STANDARDS FOR DOUBLE-DUCT AIR-CONDITIONING AND HEATING EQUIPMENT—Continued

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: Equipment manufactured starting on . . .
		HP ..	All Other Types of Heating. Electric Resistance Heating or No Heating. All Other Types of Heating.	EER = 9.8 ... EER = 9.5 ... EER = 9.3 ...	January 1, 2010. January 1, 2010. January 1, 2010.

TABLE 6 TO § 431.97—MINIMUM HEATING EFFICIENCY STANDARDS FOR DOUBLE-DUCT AIR-COOLED AIR CONDITIONING AND HEATING EQUIPMENT  
[Heat pumps]

Equipment type	Cooling capacity	Heating type	Efficiency level <sup>1</sup>	Compliance date: Equipment manufactured starting on ...
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled, Double-Duct).	≥65,000 Btu/h and <135,000 Btu/h.	Electric Resistance Heating or No Heating.	COP = 3.3 ..	January 1, 2010.
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled, Double-Duct).	≥135,000 Btu/h and <240,000 Btu/h.	All Other Types of Heating .....	COP = 3.3 ..	January 1, 2010.
		Electric Resistance Heating or No Heating.	COP = 3.2 ..	January 1, 2010.
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled, Double-Duct).	≥240,000 Btu/h and <300,000 Btu/h.	All Other Types of Heating .....	COP = 3.2 ..	January 1, 2010.
		Electric Resistance Heating or No Heating.	COP = 3.2 ..	January 1, 2010.
		All Other Types of Heating .....	COP = 3.2 ..	January 1, 2010.

<sup>1</sup> For units tested using the relevant AHRI Standards, all COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled equipment.

(c) Each non-standard size packaged terminal air conditioner (PTAC) and packaged terminal heat pump (PTHP) manufactured on or after October 7, 2010 must meet the applicable minimum energy efficiency standard level(s) set forth in Table 7 of this section. Each standard size PTAC manufactured on or after October 8, 2012, and before January 1, 2017 must meet the applicable minimum energy efficiency

standard level(s) set forth in Table 7 of this section. Each standard size PTHP manufactured on or after October 8, 2012 must meet the applicable minimum energy efficiency standard level(s) set forth in Table 7 of this section. Each standard size PTAC manufactured on or after January 1, 2017 must meet the applicable minimum energy efficiency standard level(s) set forth in Table 8 of this section.

TABLE 7 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR PTAC AND PTHP

Equipment type	Category	Cooling capacity	Efficiency level	Compliance date: products manufactured on and after . . .
PTAC .....	Standard Size	<7,000 Btu/h ..... ≥7,000 Btu/h and ≤15,000 Btu/h ..... >15,000 Btu/h .....	EER = 11.7 ..... EER = 13.8 – (0.3 × Cap <sup>1</sup> ) .... EER = 9.3 .....	October 8, 2012. <sup>2</sup> October 8, 2012. <sup>2</sup> October 8, 2012. <sup>2</sup>
	Non-Standard Size.	<7,000 Btu/h ..... ≥7,000 Btu/h and ≤15,000 Btu/h ..... >15,000 Btu/h .....	EER = 9.4 ..... EER = 10.9 – (0.213 × Cap <sup>1</sup> ) ..... EER = 7.7 .....	October 7, 2010. October 7, 2010. October 7, 2010.
PTHP .....	Standard Size	<7,000 Btu/h .....	EER = 11.9 ..... COP = 3.3	October 8, 2012.

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TABLE 7 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR PTAC AND PTHP—Continued

Equipment type	Category	Cooling capacity	Efficiency level	Compliance date: products manufactured on and after . . .
	Non-Standard Size.	≥7,000 Btu/h and ≤15,000 Btu/h .....	EER = 14.0 – (0.3 × Cap <sup>1</sup> ) .... COP = 3.7 – (0.052 × Cap <sup>1</sup> ) .....	October 8, 2012.
		>15,000 Btu/h .....	EER = 9.5 .....	October 8, 2012.
		<7,000 Btu/h .....	COP = 2.9 .....	October 7, 2010.
		≥7,000 Btu/h and ≤15,000 Btu/h .....	EER = 9.3 .....	October 7, 2010.
		>15,000 Btu/h .....	COP = 2.7 .....	October 7, 2010.
		≥7,000 Btu/h and ≤15,000 Btu/h .....	EER = 10.8 – (0.213 × Cap <sup>1</sup> ) .... COP = 2.9 – (0.026 × Cap <sup>1</sup> ) .....	October 7, 2010.
		>15,000 Btu/h .....	EER = 7.6 .....	October 7, 2010.
			COP = 2.5 .....	

<sup>1</sup> “Cap” means cooling capacity in thousand Btu/h at 95 °F outdoor dry-bulb temperature.  
<sup>2</sup> And manufactured before January 1, 2017. See Table 8 of this section for updated efficiency standards that apply to this category of equipment manufactured on and after January 1, 2017.

TABLE 8 TO § 431.97—UPDATED MINIMUM EFFICIENCY STANDARDS FOR PTAC

Equipment type	Category	Cooling capacity	Efficiency level	Compliance date: products manufactured on and after . . .
PTAC .....	Standard Size	<7,000 Btu/h .....	EER = 11.9 .....	January 1, 2017.
		≥7,000 Btu/h and ≤15,000 Btu/h .....	EER = 14.0 – (0.3 × Cap <sup>1</sup> ) ....	January 1, 2017.
		>15,000 Btu/h .....	EER = 9.5 .....	January 1, 2017.

<sup>1</sup> “Cap” means cooling capacity in thousand Btu/h at 95 °F outdoor dry-bulb temperature.

(d)(1) Each single package vertical air conditioner and single package vertical heat pump manufactured on or after January 1, 2010, but before October 9, 2015 (for models ≥65,000 Btu/h and <135,000 Btu/h) or October 9, 2016 (for models ≥135,000 Btu/h and <240,000 Btu/h), must meet the applicable minimum energy conservation standard level(s) set forth in this section.

TABLE 9 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR SINGLE PACKAGE VERTICAL AIR CONDITIONERS AND SINGLE PACKAGE VERTICAL HEAT PUMPS

Equipment type	Cooling capacity	Sub-category	Efficiency level	Compliance date: products manufactured on and after . . .
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three-phase.	<65,000 Btu/h .....	AC .....	EER = 9.0 .....	January 1, 2010
		HP .....	EER = 9.0 .....	January 1, 2010
			COP = 3.0 .....	
Single package vertical air conditioners and single package vertical heat pumps.	≥65,000 Btu/h and <135,000 Btu/h.	AC .....	EER = 8.9 .....	January 1, 2010
		HP .....	EER = 8.9 .....	January 1, 2010
			COP = 3.0 .....	
Single package vertical air conditioners and single package vertical heat pumps.	≥135,000 Btu/h and <240,000 Btu/h.	AC .....	EER = 8.6 .....	January 1, 2010
		HP .....	EER = 8.6 .....	January 1, 2010
			COP = 2.9 .....	

(2) Each single package vertical air conditioner and single package vertical heat pump manufactured on and after October 9, 2015 (for models ≥65,000 Btu/h and <135,000 Btu/h) or October 9, 2016 (for models ≥135,000 Btu/h and <240,000 Btu/h), but before September 23, 2019 must meet the applicable minimum energy conservation standard level(s) set forth in this section.

TABLE 10 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR SINGLE PACKAGE VERTICAL AIR CONDITIONERS AND SINGLE PACKAGE VERTICAL HEAT PUMPS

Equipment type	Cooling capacity	Sub-category	Efficiency level	Compliance date: Products manufactured on and after . . .
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three-phase.	<65,000 Btu/h .....	AC .....	EER = 9.0 .....	January 1, 2010
		HP .....	EER = 9.0 .....	January 1, 2010
			COP = 3.0 .....	
Single package vertical air conditioners and single package vertical heat pumps.	≥65,000 Btu/h and <135,000 Btu/h.	AC .....	EER = 10.0 .....	October 9, 2015
		HP .....	EER = 10.0 .....	October 9, 2015
			COP = 3.0 .....	
Single package vertical air conditioners and single package vertical heat pumps.	≥135,000 Btu/h and <240,000 Btu/h.	AC .....	EER = 10.0 .....	October 9, 2016
		HP .....	EER = 10.0 .....	October 9, 2016
			COP = 3.0 .....	

(3) Each single package vertical air conditioner and single package vertical heat pump manufactured on and after September 23, 2019 must meet the ap-

plicable minimum energy conservation standard level(s) set forth in this section.

TABLE 11 TO § 431.97—UPDATED MINIMUM EFFICIENCY STANDARDS FOR SINGLE PACKAGE VERTICAL AIR CONDITIONERS AND SINGLE PACKAGE VERTICAL HEAT PUMPS

Equipment type	Cooling capacity	Sub-category	Efficiency level	Compliance date: products manufactured on and after . . .
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three-phase.	<65,000 Btu/h .....	AC .....	EER = 11.0 .....	September 23, 2019.
		HP .....	EER = 11.0 .....	September 23, 2019.
			COP = 3.3	
Single package vertical air conditioners and single package vertical heat pumps.	≥65,000 Btu/h and <135,000 Btu/h.	AC .....	EER = 10.0 .....	October 9, 2015.
		HP .....	EER = 10.0 .....	October 9, 2015.
			COP = 3.0	
Single package vertical air conditioners and single package vertical heat pumps.	≥135,000 Btu/h and <240,000 Btu/h.	AC .....	EER = 10.0 .....	October 9, 2016.
		HP .....	EER = 10.0 .....	October 9, 2016.
			COP = 3.0	

(e) Each computer room air conditioner with a net sensible cooling capacity less than 65,000 Btu/h manufactured on or after October 29, 2012, and each computer room air conditioner with a net sensible cooling capacity

greater than or equal to 65,000 Btu/h manufactured on or after October 29, 2013, must meet the applicable minimum energy efficiency standard level(s) set forth in this section.

TABLE 12 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR COMPUTER ROOM AIR CONDITIONERS

Equipment type	Net sensible cooling capacity	Minimum SCOP efficiency		Compliance date: Products manufactured on and after . . .
		Downflow unit	Upflow unit	
Computer Room Air Conditioners, Air-Cooled.	<65,000 Btu/h .....	2.20	2.09	October 29, 2012.
	≥65,000 Btu/h and <240,000 Btu/h.	2.10	1.99	October 29, 2013.
	≥240,000 Btu/h and <760,000 Btu/h.	1.90	1.79	October 29, 2013.
Computer Room Air Conditioners, Water-Cooled.	<65,000 Btu/h .....	2.60	2.49	October 29, 2012.
	≥65,000 Btu/h and <240,000 Btu/h.	2.50	2.39	October 29, 2013.
	≥240,000 Btu/h and <760,000 Btu/h.	2.40	2.29	October 29, 2013.

TABLE 12 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR COMPUTER ROOM AIR CONDITIONERS—Continued

Equipment type	Net sensible cooling capacity	Minimum SCOP efficiency		Compliance date: Products manufactured on and after . . .
		Downflow unit	Upflow unit	
Computer Room Air Conditioners, Water-Cooled with a Fluid Economizer.	<65,000 Btu/h .....	2.55	2.44	October 29, 2012.
	≥65,000 Btu/h and <240,000 Btu/h.	2.45	2.34	October 29, 2013.
	≥240,000 Btu/h and <760,000 Btu/h.	2.35	2.24	October 29, 2013.
Computer Room Air Conditioners, Glycol-Cooled.	<65,000 Btu/h .....	2.50	2.39	October 29, 2012.
	≥65,000 Btu/h and <240,000 Btu/h.	2.15	2.04	October 29, 2013.
	≥240,000 Btu/h and <760,000 Btu/h.	2.10	1.99	October 29, 2013.
Computer Room Air Conditioner, Glycol-Cooled with a Fluid Economizer.	<65,000 Btu/h .....	2.45	2.34	October 29, 2012.
	≥65,000 Btu/h and <240,000 Btu/h.	2.10	1.99	October 29, 2013.
	≥240,000 Btu/h and <760,000 Btu/h.	2.05	1.94	October 29, 2013.

(f) Each variable refrigerant flow air conditioner or heat pump manufactured on or after the compliance date listed in this table must meet the applicable minimum energy efficiency standard level(s) set forth in this section.

TABLE 13 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR VARIABLE REFRIGERANT FLOW MULTI-SPLIT AIR CONDITIONERS AND HEAT PUMPS

Equipment type	Cooling capacity	Heating type <sup>1</sup>	Efficiency level	Compliance date: Products manufactured on and after . . .
VRF Multi-Split Air Conditioners (Air-Cooled).	<65,000 Btu/h .....	All .....	13.0 SEER .....	June 16, 2008.
	≥65,000 Btu/h and <135,000 Btu/h.	No Heating or Electric Resistance Heating.	11.2 EER .....	January 1, 2010.
		All Other Types of Heating.	11.0 EER .....	January 1, 2010.
	≥135,000 Btu/h and <240,000 Btu/h.	No Heating or Electric Resistance Heating.	11.0 EER .....	January 1, 2010.
		All Other Types of Heating.	10.8 EER .....	January 1, 2010.
	≥240,000 Btu/h and <760,000 Btu/h.	No Heating or Electric Resistance Heating.	10.0 EER .....	January 1, 2010.
		All Other Types of Heating.	9.8 EER .....	January 1, 2010.
	<65,000 Btu/h .....	All .....	13.0 SEER .....	June 16, 2008.
	≥65,000 Btu/h and <135,000 Btu/h.	No Heating or Electric Resistance Heating.	7.7 HSPF 11.0 EER .....	January 1, 2010.
		All Other Types of Heating.	3.3 COP 10.8 EER .....	January 1, 2010.
VRF Multi-Split Heat Pumps (Air-Cooled) .....	≥135,000 Btu/h and <240,000 Btu/h.	No Heating or Electric Resistance Heating.	3.3 COP 10.6 EER .....	January 1, 2010.
		All Other Types of Heating.	3.2 COP 10.4 EER .....	January 1, 2010.
	≥240,000 Btu/h and <760,000 Btu/h.	No Heating or Electric Resistance Heating.	3.2 COP 9.5 EER .....	January 1, 2010.
		All Other Types of Heating.	3.2 COP 9.3 EER .....	January 1, 2010.
	<17,000 Btu/h .....	Without heat recovery.	12.0 EER .....	October 29, 2012.
		With heat recovery ..	4.2 COP .....	October 29, 2003.
			11.8 EER .....	October 29, 2012.
			4.2 COP .....	October 29, 2003.



TABLE 13 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR VARIABLE REFRIGERANT FLOW MULTI-SPLIT AIR CONDITIONERS AND HEAT PUMPS—Continued

Equipment type	Cooling capacity	Heating type <sup>1</sup>	Efficiency level	Compliance date: Products manufactured on and after . . .
	≥17,000 Btu/h and <65,000 Btu/h.	All .....	12.0 EER .....	October 29, 2003.
	≥65,000 Btu/h and <135,000 Btu/h.	All .....	4.2 COP .....	October 29, 2003.
	≥135,000 Btu/h and <760,000 Btu/h.	Without heat recovery.	12.0 EER .....	October 29, 2013.
		With heat recovery ..	4.2 COP .....	October 29, 2013.
			10.0 EER .....	October 29, 2013.
			3.9 COP .....	October 29, 2013.
			9.8 EER .....	October 29, 2013.
			3.9 COP .....	October 29, 2013.

<sup>1</sup> VRF Multi-Split Heat Pumps (Air-Cooled) with heat recovery fall under the category of “All Other Types of Heating” unless they also have electric resistance heating, in which case it falls under the category for “No Heating or Electric Resistance Heating.”

[77 FR 28991, May 16, 2012, as amended at 77 FR 76830, Dec. 31, 2012; 80 FR 42664, July 17, 2015; 80 FR 43212, July 21, 2015; 80 FR 56895, Sept. 21, 2015; 80 FR 57500, Sept. 23, 2015; 81 FR 2529, Jan. 15, 2016; 81 FR 53907, Aug. 15, 2016]

EFFECTIVE DATE NOTE: At 87 FR 65668, Nov. 1, 2022, § 431.97 was amended by adding paragraph (g) and table 14, effective Jan. 3, 2023. For the convenience of the user, the added text is set forth as follows:

**§ 431.97 Energy efficiency standards and their compliance dates.**

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TABLE 14 TO § 431.97—MINIMUM EFFICIENCY STANDARDS FOR DIRECT EXPANSION-DEDICATED OUTDOOR AIR SYSTEMS

Equipment type	Subcategory	Efficiency level	Compliance date: equipment manufactured starting on . . .
Direct expansion-dedicated outdoor air systems.	(AC)—Air-cooled without ventilation energy recovery systems.	ISMRE2 = 3.8 .....	May 1, 2024.
	(AC w/VERS)—Air-cooled with ventilation energy recovery systems.	ISMRE2 = 5.0 .....	May 1, 2024.
	(ASHP)—Air-source heat pumps without ventilation energy recovery systems.	ISMRE2 = 3.8 .....	May 1, 2024.
	(ASHP w/VERS)—Air-source heat pumps with ventilation energy recovery systems.	ISCOP2 = 2.05 .....	May 1, 2024.
	(WC)—Water-cooled without ventilation energy recovery systems.	ISMRE2 = 5.0 .....	May 1, 2024.
	(WC w/VERS)—Water-cooled with ventilation energy recovery systems.	ISCOP2 = 3.20 .....	May 1, 2024.
	(WSHP)—Water-source heat pumps without ventilation energy recovery systems.	ISMRE2 = 4.7 .....	May 1, 2024.
	(WSHP w/VERS)—Water-source heat pumps with ventilation energy recovery systems.	ISMRE2 = 5.1 .....	May 1, 2024.
		ISCOP2 = 2.13 .....	May 1, 2024.
		ISMRE2 = 4.6 .....	May 1, 2024.
		ISCOP2 = 4.04 .....	May 1, 2024.