

Department of Energy

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TABLE 1 TO § 431.96—TEST PROCEDURES FOR ALL SMALL COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, FOR LARGE COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, FOR VERY LARGE COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, AND FOR PACKAGED TERMINAL AIR-CONDITIONERS, AND PACKAGED TERMINAL HEAT PUMPS—Continued

Product	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions and procedures ¹ in
Very Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air Cooled AC and HP	≥240,000 Btu/h and <760,000 Btu/h.	EER COP	ARI Standard 340/360–2004. ARI Standard 340/360–2004.
Packaged Terminal Air-Conditioners and Heat Pumps.	AC and HP HP	All All	EER COP	ARI Standard 310/380–2004. ARI Standard 310/380–2004.

¹ Incorporated by reference, see § 431.95.

[71 FR 73170, Dec. 8, 2006]

ENERGY EFFICIENCY STANDARDS

§ 431.97 Energy efficiency standards and their effective dates.

(a) Each commercial air conditioner or heat pump (including single package vertical air conditioners and single package vertical heat pumps) manufac-

tured on or after January 1, 1994 (except for large commercial package air-conditioning and heating equipment, for which the effective date is January 1, 1995) must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1 and 2 of this section.

TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY LEVELS

Product	Category	Cooling capacity	Sub-category	Efficiency level ¹	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
Small Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled, 3 Phase.	<65,000 Btu/h	Split System	SEER = 10.0	SEER = 10.0.
			Single Package	SEER = 9.7	SEER = 9.7.
	Air Cooled	≥65,000 Btu/h and <135,000 Btu/h.	All	EER = 8.9	EER = 8.9.
	Water Cooled, Evaporatively Cooled, and Water-Source.	<17,000 Btu/h	AC	EER = 9.3	EER = 12.1.
HP			EER = 9.3	EER = 11.2.	
Large Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled	≥17,000 Btu/h and <65,000 Btu/h. ≥65,000 Btu/h and <135,000 Btu/h. ≥135,000 Btu/h and <240,000 Btu/h.	AC	EER = 9.3	EER = 12.1.
			HP	EER = 9.3	EER = 12.0.
			AC	EER = 10.5	EER = 11.5. ²
			HP	EER = 10.5	EER = 12.0.
			All	EER = 8.5	EER = 8.5.
Packaged Terminal Air Conditioners and Heat Pumps.	All	<7,000 Btu/h	All	EER = 9.6	EER = 9.6. ³
			>7,000 Btu/h and ≤15,000 Btu/h.	EER = 8.88
				EER = 10.0 – (0.16 × capacity [in kBtu/h at 95 °F outdoor dry-bulb temperature]).	EER = 10.0 – (0.16 × capacity [in kBtu/h at 95 °F outdoor dry-bulb temperature]).

TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY LEVELS—Continued

Product	Category	Cooling capacity	Sub-category	Efficiency level ¹	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
		>15,000 Btu/h	EER = 7.6	EER = 7.6.

¹ For equipment rated according to the ARI standards, all EER values must be rated at 95 °F outdoor dry-bulb temperature for air-cooled products and evaporatively cooled products and at 85 °F entering water temperature for water-cooled products. For water-source heat pumps rated according to the ISO standard, EER must be rated at 30 °C (86 °F) entering water temperature.
² Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.
³ Effective 10/29/2004, the minimum value became EER = 11.0.

TABLE 2 TO § 431.97—MINIMUM HEATING EFFICIENCY LEVELS

Product	Category	Cooling capacity	Sub-category	Efficiency level ¹	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
Small Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled, 3 Phase.	<65,000 Btu/h	Split System	HSPF = 6.8	HSPF = 6.8.
			Single Package	HSPF = 6.6	HSPF = 6.6.
	Water-Source	<135,000 Btu/h	Split System and Single Package.	COP = 3.8	COP = 4.2.
	Air Cooled	≥65,000 Btu/h and <135,000 Btu/h.	All	COP = 3.0	COP = 3.0.
Large Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled	≥135,000 Btu/h and <240,000 Btu/h.	Split System and Single Package.	COP = 2.9	COP = 2.9.
Packaged Terminal Heat Pumps.	All	All	All	COP = 1.3 + (0.16 × the applicable minimum cooling EER prescribed in Table 1—Minimum Cooling Efficiency Levels).	COP = 1.3 + (0.16 × the applicable minimum cooling EER prescribed in Table 1—Minimum Cooling Efficiency Levels).

¹ For units tested by ARI standards, all COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled products, and at 70 °F entering water temperature for water-source heat pumps. For heat pumps tested by the ISO Standard 13256-1, the COP values must be obtained at the rating point with 20 °C (68 °F) entering water temperature.

(b) Commercial package air conditioning and heating equipment manufactured on or after January 1, 2010 (except for air-cooled, three-phase small commercial package air-conditioning

and heating equipment <65,000 Btu/h for which the effective date is June 16, 2008) must meet the applicable energy efficiency standards set forth in this section.

Product	Cooling capacity (Btu/h)	Category	Efficiency level†
Small commercial package air conditioning and heating equipment, (air-cooled, three-phase).	<65,000	AC	SEER=13.0.
		HP	SEER=13.0. HSPF=7.7.
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three phase.	<65,000	AC	EER=9.0.
		HP	EER=9.0. COP=3.0.
Single package vertical air conditioners and single package vertical heat pumps.	≥ 65,000 and <135,000	AC	EER=8.9.
		HP	EER=8.9. COP=3.0.
Single package vertical air conditioners and single package vertical heat pumps.	≥135,000 and <240,000	AC	EER=8.6.

Product	Cooling capacity (Btu/h)	Category	Efficiency level†
Small commercial package air-conditioning and heating equipment (air-cooled).	≥65,000 and <135,000	HP	EER=8.6. COP=2.9.
		AC	EER = 11.2* EER = 11.0**
Large commercial package air-conditioning and heating equipment (air-cooled).	≥135,000 and <240,000	HP	EER = 11.0* EER = 10.8**
		AC	EER = 11.0* EER = 10.8**
Very large commercial package air-conditioning and heating equipment (air-cooled).	≥ 240,000 and <760,000	HP	EER = 10.6* EER = 10.4**
		AC	EER = 10.0* EER = 9.8**
Small commercial package air-conditioning heat pump.	≥65,000 and <135,000	HP	EER = 9.5* EER = 9.3** COP = 3.3
Large commercial package air-conditioning heat pump.	≥135,000 and <240,000	HP	COP = 3.2
Very large commercial package air-conditioning heat pump.	≥ 240,000 and <760,000	HP	COP = 3.2

* This EER level applies to equipment that has electric resistance heat or no heating.
 ** This EER level applies to equipment with all other heating-system types that are integrated into the unitary equipment.
 †EER at a standard temperature rating of 95 °F dry-bulb and COP at a high temperature rating of 47 °F dry-bulb.

(c) Each standard size packaged terminal air conditioner or packaged terminal heat pump manufactured on or after September 30, 2010, shall have an Energy Efficiency Ratio and Coefficient of Performance no less than:

Equipment class			Energy conservation standards *
Equipment	Category	Cooling capacity (British thermal units per hour [Btu/h])	
PTAC	Standard Size	<7,000	EER = 11.7
		7,000–15,000	EER = 13.8 – (0.300 × Cap**)
		>15,000	EER = 9.3
PTHP	Non-Standard Size	<7,000	EER = 9.4
		7,000–15,000	EER = 10.9 – (0.213 × Cap**)
		>15,000	EER = 7.7
PTHP	Standard Size	<7,000	EER = 11.9
		7,000–15,000	COP = 3.3
		>15,000	EER = 14.0 – (0.300 × Cap**) COP = 3.7 – (0.052 × Cap**)
	Non-Standard Size	<7,000	EER = 9.5 COP = 2.9
		7,000–15,000	EER = 9.3 COP = 2.7
		>15,000	EER = 10.8 – (0.213 × Cap**) COP = 2.9 – (0.026 × Cap**) EER = 7.6 COP = 2.5

* For equipment rated according to the DOE test procedure, all EER values must be rated at 95 °F outdoor dry-bulb temperature for air-cooled products and evaporatively-cooled products and at 85 °F entering water temperature for water-cooled products. All COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled products, and at 70 °F entering water temperature for water-source heat pumps.
 ** Cap means cooling capacity in thousand British thermal units per hour (Btu/h) at 95 °F outdoor dry-bulb temperature.

(d) Each water-cooled and evaporatively-cooled commercial package air conditioning and heating equipment with a cooling capacity at or above 240,000 Btu/h and less than 760,000 Btu/h manufactured on or after January 10, 2011, shall meet the following standard levels:
 (1) For equipment that utilizes electric resistance heat or without heating, the energy efficiency ratio must be not less than 11.0.

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(2) For equipment that utilizes all other types of heating, the energy efficiency ratio must be not less than 10.8.

[69 FR 61969, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005; 70 FR 61698, Oct. 25, 2005; 71 FR 71371, Dec. 8, 2006; 73 FR 58828, Oct. 7, 2008; 74 FR 12073, Mar. 23, 2009; 74 FR 36354, July 22, 2009]

Subpart G—Commercial Water Heaters, Hot Water Supply Boilers and Unfired Hot Water Storage Tanks

SOURCE: 69 FR 61983, Oct. 21, 2004, unless otherwise noted.

§ 431.101 Purpose and scope.

This subpart contains energy conservation requirements for certain commercial water heaters, hot water supply boilers and unfired hot water storage tanks, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

[69 FR 61983, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

§ 431.102 Definitions concerning commercial water heaters, hot water supply boilers, and unfired hot water storage tanks.

The following definitions apply for purposes of this subpart G, and of subparts J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in section 340 of the Act, 42 U.S.C. 6311.

ASTM-D-2156-80 means the test standard published in 1980 by the American Society of Testing and Measurements and titled Method for Smoke Density in Flue Gases from Burning Distillate Fuels.

Basic model means all units of a given type of covered product (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency.

10 CFR Ch. II (1–1–12 Edition)

Hot water supply boiler means a packaged boiler that is industrial equipment and that,

(1) Has an input rating from 300,000 Btu/hr to 12,500,000 Btu/hr and of at least 4,000 Btu/hr per gallon of stored water,

(2) Is suitable for heating potable water, and

(3) Meets either or both of the following conditions:

(i) It has the temperature and pressure controls necessary for heating potable water for purposes other than space heating, or

(ii) The manufacturer's product literature, product markings, product marketing, or product installation and operation instructions indicate that the boiler's intended uses include heating potable water for purposes other than space heating.

Instantaneous water heater means a water heater that has an input rating not less than 4,000 Btu/hr per gallon of stored water, and that is industrial equipment, including products meeting this description that are designed to heat water to temperatures of 180 °F or higher.

Packaged boiler means a boiler that is shipped complete with heating equipment, mechanical draft equipment and automatic controls; usually shipped in one or more sections and does not include a boiler that is custom designed and field constructed. If the boiler is shipped in more than one section, the sections may be produced by more than one manufacturer, and may be originated or shipped at different times and from more than one location.

R-value means the thermal resistance of insulating material as determined based on ASTM Standard Test Method C177-97 or C518-91 and expressed in (°F·ft²·h/Btu).

Standby loss means the average hourly energy required to maintain the stored water temperature, expressed as applicable either (1) as a percentage (per hour) of the heat content of the stored water and determined by the formula for S given in Section 2.10 of ANSI Z21.10.3-1998, denoted by the term "S," or (2) in Btu per hour based on a 70 °F temperature differential between stored water and the ambient temperature, denoted by the term "SL."