

# Regulatory Issues Associated with CRAC-type Units

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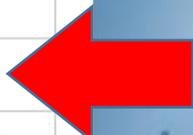
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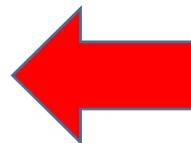
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## Computer Room Air Conditioners

Many sales representatives, engineers, and owners may not fully understand the energy efficiency requirements for Computer Room Air Conditioners (CRAC). This support page includes information regarding the applicable Department of Energy (DOE), California Energy Commission (CEC), and Canadian Ontario Ministry of Energy (OME) standards. Should your local city or state government, Mechanical Engineer of Record (MEOR), or Authority Having Jurisdiction (AHJ) have different requirements from those listed herein, please first direct them to this website for review, and if needed, direct specific questions to **Justin Prosser** at AHRI.

CRAC units differ from 'comfort cooling' commercial air conditioners both in their intended use and in the way their energy efficiency performance is measured. Under ASHRAE Standard 127-2007, Sensible Cooling Capacity (not Total Cooling Capacity) is used to calculate a Sensible Coefficient of Performance, or SCOP. CRAC efficiencies are NOT represented by any other efficiency measurements such as IEER, EER, SEER, IPLV, or COP.

- ▶ [Ongoing Rulemakings](#)
- ▶ [Future Regulations](#)
- ▶ [Current Efficiency Standards](#)



### ▼ Current Efficiency Standards

- ▶ ASHRAE Standard 90.1
- ▶ United States Federal Department of Energy (DOE):
- ▶ U.S. State and Local Codes
- ▶ Ontario, Canada Ministry of Energy (OME):

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EPA Energy Star

▼ **United States Federal Department of Energy (DOE):**

DOE has regulated the energy efficiency of CRACs since 2012. In the Code of Federal Regulations (CFR), DOE defines a CRAC as “a basic model of commercial package air-conditioning and heating equipment (packaged or split) that is: Used in computer rooms, data processing rooms, or other information technology cooling applications; rated for sensible coefficient of performance (SCOP) and tested in accordance with 10 CFR 431.96, and is not a covered consumer product under 42 U.S.C. 6291(1)-(2) and 6292. A computer room air conditioner may be provided with, or have as available options, an integrated humidifier, temperature, and/or humidity control of the supplied air, and reheating function.” CFR 431.92.

Effective July 1, 2015, DOE requires manufacturers to certify the sensible cooling capacity and SCOP efficiency of up-flow or down-flow, floor mounted, direct expansion (DX) CRAC cooling products, and to post certified ratings on the DOE public database (**Compliance Certification Management System (CCMS)**). The listings for CRAC products are under “Air Conditioners and Heat Pumps—Computer Room Air Conditioners.”

The required federal minimum efficiencies for these specific products are shown in the table below (10 CFR 431.97 – Table 7).

### Minimum Efficiencies

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.
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.

	<240,000 Btu/h			
	≥240,000 Btu/h and <760,000 Btu/h	2.40	2.29	October 29, 2013.
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.

### Products NOT Regulated by DOE:

According to guidance documents issued by DOE, the products listed below are covered equipment but don't have to meet minimum energy conservation standards. DOE does not define minimum efficiencies for the following CRAC products. Because manufacturers do not certify the efficiency of these products to DOE, they are not listed on the **CCMS**.

- **Chilled water** computer room air-handler (CRAH) products (products that use cold chilled water to cool the air)
- **Horizontal flow** floor mounted CRAC products (most often applied between server racks) — **DOE Guidance**
- **Ceiling mounted** CRAC products — **DOE Guidance**

### DOE Compliance Monitoring and Implications:

If the product is an up-flow or down-flow, floor mounted, direct expansion (DX) CRAC cooling product as defined by DOE, it is the responsibility of the manufacturer to list the product on the **CCMS** in order to sell the product in the U.S. and its territories.

Manufacturers who are non-compliant are subject to federal financial penalties and potential suspension of sales (see CFR 429.114 and CFR 429.120).

## ▼ U.S. State and Local Codes

State and local jurisdictions may establish building codes for new construction. For commercial equipment these codes may not be more stringent than the DOE requirements. However, for new construction, states may adopt ASHRAE 90.1 Standards before DOE makes updates to reflect the latest ASHRAE 90.1 requirements.

### California Energy Commission (CEC):

The California Energy Commission (CEC) has regulated the energy efficiency of CRACs since 1988. Similar to the U.S. federal CCMS database, CEC requires that up-flow or down-flow, floor mounted, direct expansion (DX) CRAC cooling products have sensible cooling capacity and SCOP efficiency certified by the manufacturer on the CEC **Modernized Appliance Efficiency Database System (MAEDBS)** in order to be eligible for sale in California.

### Minimum Efficiencies

Because federal regulations regarding energy efficiency of CRACs preempt differing state law, the CEC in general follows the definitions and requirements of the DOE for these products. See **CEC Title 20 – 2015 Appliance Efficiency Regulations**, page 21, which, for example, uses the federal definition of CRAC. The minimum efficiencies for these products in California are set by the federal requirements noted above (see **CEC Title 20**, Tables C-6). In addition, chilled water computer room air-handler, horizontal flow floor mounted and ceiling mounted products do not have minimum efficiencies and are not required to be listed on the **MAEDBS** pursuant to **DOE Guidance on horizontal flow units** and **DOE Guidance on ceiling mounted units**.

However, note that CEC also defines minimum efficiencies for evaporatively-cooled products (see **CEC Title 20**, Tables C-8). AHRI believes these requirements are preempted under 42 U.S.C. § 6316 and California does not have the authority to establish separate standards for these products.

The requirements regarding energy efficiency minimums should not be confused with Title 24 – Building Energy Efficiency Program, which covers the overall efficient design of a building. As a basic requirement of Title 24, an appliance (in our case a CRAC) must meet the minimum energy conservation listed in Title 20 and must be listed in the CEC MAEDBS. In addition, Title 24 stipulates certain options, such-as electric reheat, that cannot be used and certain options, such as an economizer, that may be required.