

**INTERPRETATION IC 90.1-2001-9 OF
ANSI/ASHRAE/IESNA STANDARD 90.1-2001
Energy Standard for Buildings Except Low-Rise Residential Buildings**

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Request from: Mick Schwedler, PE (E-mail: Mschwedler@trane.com), Trane, 3600 Pammel Creek Road, La Crosse, WI 54601-5199, and Wayne Morris (E-mail: Wmorris@trane.com), Trane, PO Box 10271, Macon, GA 31206.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2001, Section 6.3.1 Economizers, specifically Exception 6.3.1i relating to the cooling efficiency and the efficiency requirements in Table 6.1.3.

Background:

(The background information provided is meant to reduce the time SSPC 90.1 needs to find the relevant sections in the standard.)

“6.3.1 Economizers. Each cooling system having a fan shall include either an air or water economizer meeting the requirements of 6.3.1.1 through 6.3.1.4.

Exceptions to 6.3.1: Economizers are not required for the systems listed below...

- (i) Where the cooling efficiency meets or exceeds the efficiency requirements in Table 6.1.3.”

Table 6.1.3 (Partial)

Table 6.1.3 gives the following information for its “Other Unitary Systems” section.

Other Unitary Systems							
System Size (kBtuh/h)	Mandatory Minimum EER	Cooling Degree-Days (CDD50)					
		0-3600	3601-5400	5401-7200	7201- 9000	9001- 10800	
		Minimum Cooling Efficiency Required (EER)^a					Test Procedure^c
≥ 65 and < 135	10.3	N/A ^b	12.5	12.0	11.5	11.0	ARI 210/240
≥ 135 and ≤ 240	9.7	N/A ^b	11.5	11.1	10.6	10.1	ARI 340/360
> 240 and < 760	9.5	N/A ^b	11.2	10.7	10.3	9.9	

^aEach EER shown below should be reduced for units with a heating section other than electric resistance heat.

^bElimination of required economizer is not allowed.

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

Table 6.2.1A (Partial)

Table 6.2.1A Shows the following efficiency requirements for various pieces of equipment. (For simplicity other columns are not shown here, and only the “Electric Resistance (or Non) Heating Section type Efficiencies are shown.)

Equipment Type	Size Category	Minimum Efficiency
Air Conditioners Air-Cooled	<65,000 Btu/h	10.0 SEER
	≥ 65,000 Btu/h and < 135,000 Btu/h	10.3 EER
	≥ 135 Btu/h and ≤ 240 Btu/h	9.7 EER
	> 240 Btu/h and < 760 Btu/h	9.5 EER
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Air Conditioners, Water and Evaporatively Cooled	<65,000 Btu/h	12.1 EER
	≥ 65 Btu/h and < 135 Btu/h	11.5 EER
	≥ 135 Btu/h and ≤ 240 Btu/h	11.0 EER
	> 240 Btu/h and < 760 Btu/h	10.8 EER

Background from ASHRAE/IESNA Standard 90.1-1999 User’s Manual

Page 6-41, Section 6.3.1i states the following

“i) *High-Efficiency Unitary Equipment Exception*

Where installed in climates with more than 3,600 CDD50, unitary air-cooled cooling equipment that has energy efficiency ratios that meet or exceed the efficiency requirements in Table 6.1.3 are not required to have economizers.”

Exception 6.3.1i uses Table 6.1.3 and excepts an economizer from being required if “Unitary” equipment reaches a specific, climate and size dependent efficiency that is greater than the minimum required efficiency.

1. The User’s Manual (page 6-41) explicitly states that exception 6.3.1i applies to air-cooled equipment. The manual was approved for publication by SSPC 90.1 and ASHRAE.
2. The Mandatory Minimum EER’s in Table 6.1.3 and the *Air Cooled* Minimum Efficiency requirements in Table 6.2.1A are the same. This implies the Table 6.1.3 is to apply only to Air Cooled equipment.
3. In Table 6.2.1A, the efficiency for a Water Cooled or Evaporatively Cooled Air Conditioners ≥ 240,000 Btu/h (with electric resistance heat) is 11.0 EER. If Table 6.1.3 was meant to apply to this size and type of equipment, one would be excepted from the economizer requirement in any location that had 5401 or greater CDD(50). We don’t believe this is the committee’s intent.

We therefore conclude that the term “Unitary” as used in Table 6.1.3 is meant to apply only to “Air-Cooled Unitary” Systems.

Interpretation 1: Exception 6.3.1i and Table 6.1.3 are intended to be used only for air-cooled unitary equipment.

Question 1: Is this interpretation correct?

Answer 1: Yes

Comments 1:

Interpretation 2: This interpretation also applies to Section 6.1.3c with respect to evaporatively cooled unitary equipment.

Question 2: Is this interpretation correct?

Answer 2: No

Comments 2: As clarified in Question 1, Table 6.1.3 is only applicable to air-cooled unitary equipment. Hence, the exception in 6.3.1c also applies only to air-cooled unitary equipment.

Interpretation 3: These interpretations hold true for both 90.1-1999 and 90.1-2001.

Question 3: Is this interpretation correct?

Answer 3: Yes

Comments 3: Additional Information: As a result of your request a change will be proposed to modify the title of Table 6.1.3 to “Other Air-Cooled Unitary Systems”.