ADDENDA

ANSI/ASHRAE/IES Addendum i to
ANSI/ASHRAE/IES Standard 90.1-2013

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on August 24, 2016; by the ASHRAE Tech Council on August 29, 2016; by the IES Board of Directors on September 26, 2016; and by the American National Standards Institute on August 30, 2016.

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FOREWORD

Addendum aq to Standard 90.1-2010 revised the threshold capacity requirements for the use of economizers on fan cooling units. A detailed economic analysis was performed to justify the expanded requirements for the use of economizers using commercial HVAC buildings. Because there was no benchmark building defined for computer rooms, the economizer requirements for computer rooms were not changed, and the requirements in ASHRAE Standard 90.1-2007 were used.

The load profile of a data center is different than that of a commercial office building. Due to the high internal load of data processing equipment heat rejection, the load profile is much flatter and the HVAC equipment will run in cooling to much lower ambients than for a commercial HVAC comfort cooling system. Considering this, it is obvious that the requirements for the use of economizer on computer rooms should be at least equivalent to the requirements for comfort cooling.

The committee has completed an analysis of a typical computer room in all 17 climate zones using the benchmark city weather data. No benchmark building or load profile existed that could be used, but a load profile was assumed to be at full design capacity at the design 1% conditions and at 60% load at 0°F. Due to concerns about humidity control in the computer rooms and having to humidify the outside free cooling air, the use of economizers was cut off when the ambient wet-bulb was below 35°F wb. Using these data and the cost model developed for the justification of addendum aq to the Standard 90.1-2007, the scalar economic analysis was updated using the new economic criteria developed for the 2013 to 2016 ASHRAE 90.1 cycle. Assuming a 15 year design life, this resulted in a 10.8 year maximum allowable scalar. The analysis show that if the criteria for HVAC economizers was adopted, the maximum scalar is 7.4, which is well below the maximum allowed scalar of 10.8; so it has been shown that we can easily justify the elimination of the computer room economizer size criteria, and the use of the HVAC economizer table for all products can easily be justified.

As such, this addendum eliminates Table 6.5.1-2 and requires that table 6.5.1-1 be used for both HVAC and computer room units.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum i to 90.1-2013

Revise the standard as follows (I-P and SI):

6.5.1 Economizers. Each cooling system that has a fan shall include either an air or water economizer meeting the requirements of Sections 6.5.1.1 through 6.5.1.6.

Exceptions: Economizers are not required for the following systems:

1. Individual fan-cooling units with a supply capacity less than the minimum listed in Table 6.5.1-1 ~~for comfort cooling applications and Table 6.5.1-2 for computer room applications.~~
2. Systems that include nonparticulate air treatment as required by Section 6.2.1 in Standard 62.1.

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Revise Table 6.5.1-1 and delete Table 6.5.1-2 as shown (I-P and SI):

TABLE 6.5.1-1 Minimum Fan-Cooling Unit Size for which an Economizer is Required ~~for Comfort Cooling~~

Climate Zones	Cooling Capacity for Which an Economizer is Required
1a, 1b	No economizer requirement
2a, 2b, 3a, 4a, 5a, 6a 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8	≥54,000 Btu/h

~~TABLE 6.5.1-2 Minimum Fan-Cooling Unit Size for which an Economizer is Required for Computer Rooms~~

~~Climate Zones~~	~~Cooling Capacity for Which an Economizer is Required~~
~~1a, 1b, 2a, 3a, 4a~~	~~No economizer requirement~~
~~2b, 5a, 6a, 7, 8~~	~~≥135,000 Btu/h~~
~~3b, 3c, 4b, 4c, 5b, 5c, 6b~~	~~≥65,000 Btu/h~~

TABLE 6.5.1-1 Minimum Fan-Cooling Unit Size for which an Economizer is Required ~~for Comfort Cooling~~

Climate Zones	Cooling Capacity for Which an Economizer is Required
1a, 1b	No economizer requirement
2a, 2b, 3a, 4a, 5a, 6a 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8	≥16 kW

~~TABLE 6.5.1-2 Minimum Fan-Cooling Unit Size for which an Economizer is Required for Computer Rooms~~

~~Climate Zones~~	~~Cooling Capacity for Which an Economizer is Required~~
~~1a, 1b, 2a, 3a, 4a~~	~~No economizer requirement~~
~~2b, 5a, 6a, 7, 8~~	~~≥40 kW~~
~~3b, 3c, 4b, 4c, 5b, 5c, 6b~~	~~≥19 kW~~

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

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