



**BSR/ASHRAE/IES Addendum c
to ANSI/ASHRAE/IES Standard 90.1-2019**

Public Review Draft

Proposed Addendum c to Standard 90.1-2019, Energy Standard for Buildings Except Low-Rise Residential Buildings

**First Public Review (February 2020)
(Draft Shows Proposed Changes to Current Standard)**

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Section 6.4.3.3 includes an exception for off-hour controls in small units. However, this negates the requirements in 6.4.3.3.1 for residential spaces that typically have small HVAC units. The controls for hotel and motel guest rooms have been shown to be cost effective and less costly and less complex controls for apartments will also be cost effective and are readily available. These programmable thermostats are required under residential energy codes for residential spaces in buildings three stories and lower. An exception is made here to allow them in other spaces.

Similar provisions to the simplified systems in 6.3.2 are adjusted to make them consistent with the description of unoccupied setback controls elsewhere in the standard.

A review of thermostats available in the market shows that going from one with no scheduling capability to one with weekday/weekend schedule capability adds between \$0 and \$13 per thermostat. So at 2 kW, the incremental cost is covered in all climate zones that require heating based on the 90.1 scalar cost effectiveness analysis.

This revision limits the exceptions to non-residential spaces and lowers the exception limit to 2 kW. It also allows a simplified schedule (two schedules per week) for units under 5 kW. Residential spaces are defined in 90.1 as:

residential: spaces in buildings used primarily for living and sleeping. *Residential spaces* include, but are not limited to, *dwelling units*, hotel/motel guest rooms, dormitories, nursing homes, patient rooms in hospitals, lodging houses, fraternity/sorority houses, hostels, prisons, and fire stations.

dwelling unit: a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum c to 90.1-2019

(IP and SI Units)

Revise Sections 6.3.2 and 6.4.3.3 of the Standard as follows:

6.3.2 Criteria

The HVAC system must meet all of the following criteria:

...

- j. ~~Systems serving spaces other than hotel/motel guest rooms residential spaces, and other than those that do not require~~ ing continuous operation, which have both with a cooling or heating capacity greater than 15,000 7,000 Btu/h (2.1 kW) and a supply fan motor power greater than 0.75 hp, shall be provided with a time clock that (1) can start and stop the system under different schedules for seven different day types per week, (2) is capable of retaining programming and time setting during a loss of power for a period of at least ten hours, (3) includes an accessible manual override that allows temporary operation of the system for up to two hours, (4) is capable of and configured with temperature setback down to 55°F during off hours, and (5) is capable of capable of and configured with temperature setup to 90°F during off hours. ~~shall comply with Section 6.4.3.3.1 and 6.4.3.3.2.~~
- k. Systems serving residential spaces other than hotel/motel guest rooms shall comply with Section 6.4.3.3.1 and 6.4.3.3.2 except for electric resistance heaters rated at 1.5 kW or less with a readily accessible manual control that lowers the setpoint or turns the unit off.
- l. Systems serving hotel/motel guest rooms shall comply with Section 6.4.3.3.5.

... [renumber following items] ...

6.4.3.3 Off-Hour Controls

HVAC systems shall have the off-hour controls required by Sections 6.4.3.3.1 through 6.4.3.3.5.

Exceptions to 6.4.3.3

1. HVAC systems intended to operate continuously.
2. HVAC systems not serving residential spaces and having a design heating capacity and cooling capacity less than 15,000 7,000 Btu/h (2.1 kW) that are equipped with a readily accessible manual on/off controls.

6.4.3.3.1 Automatic Shutdown

HVAC systems shall be equipped with at least one of the following:

- a. *Controls* that can start and stop the *system* under different time schedules for seven different day types per week, are capable of retaining programming and time setting during loss of power for a period of at least ten hours, and include an accessible *manual* override or equivalent function that allows temporary operation of the *system* for up to two hours.
- b. An *occupancy sensor* that is capable of shutting the *system* off when no occupant is sensed for a period of up to 30 minutes.
- c. A manually operated timer capable of being adjusted to operate the *system* for up to two hours.
- d. An interlock to a security *system* that shuts the *system* off when the security *system* is activated.

Exceptions to 6.4.3.3.1

1. Systems serving Residential occupancies with ~~may use~~ controls that can start and stop the system under at least two different time schedules per week.
2. Systems serving non-residential occupancies where heating or cooling capacity is less than 15,000 Btu/hour (4.4 kW) with controls that can start and stop the system under at least two different time schedules per week.

6.4.3.3.2 Setback Controls

Heating *systems* shall be equipped with *controls* capable of and configured to *automatically* restart and temporarily operate the *system* as required to maintain zone temperatures above an adjustable heating *set point* at least 10°F below the occupied heating *set point*. Cooling *systems* shall be equipped with *controls* capable of and configured to *automatically* restart and temporarily operate the *mechanical cooling system* as required to maintain zone temperatures below an adjustable cooling *set point* at least 5°F above the occupied cooling *set point* or to prevent high *space* humidity levels.

Exception to 6.4.3.3.2

Radiant heating systems capable of and configured with a *setback* heating *set point* at least 4°F below the occupied heating *set point*.