ADDENDA

ANSI/ASHRAE/IES Addendum dc to
ANSI/ASHRAE/IES Standard 90.1-2022

Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on December 5, 2025, and by the Illuminating Engineering Society on December 4, 2025.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (https://www.ashrae.org/continuous-maintenance).

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FOREWORD

Addendum dc updates the language in the heat-pump water-heater energy credit to better align the credit with how commercial heat-pump water heaters are tested under the U.S. Department of Energy test procedure. The energy credit values have been recalculated to reflect the changes in credit requirements for commercial equipment.

This addendum impacts an optional performance path in the standard designed to provide increased flexibility and therefore was not subjected to a cost-effectiveness analysis.

Informative 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 dc to Standard 90.1-2022

Modify Section 11.5.2.3.1(b) as shown (I-P and SI).

[. . .]

b. **W02: Heat-Pump Water Heater.** To achieve this credit, air source heat-pump *water heater*s shall be installed according to the *manufacturer*'s instructions, and at least 30% of design end-use *service water heating* requirements shall be met using only heat-pump heating at an ambient condition of 67.5°F(19.7°C) db without supplemental *electric resistance* or *fossil fuel* heating. For a hybrid heat-pump *water heater*, the heat-pump-only capacity shall be deemed at 40% of first hour draw. Where the heat-pump-only capacity exceeds 50% of the design end-use load, excluding *recirculating system* losses, the credits from the Section 11.5.3 tables shall be prorated as follows:

$$EC_{W02\_calc} = EC_{W02\_base} \times \frac{Cap_{HPWH}}{EndLoad \times 0.5} \text{ ~~(not greater than 2)}$$

where

EC_{W02_calc} = *energy* credits achieved for heat-pump *water heater*; EC_{W02_calc} shall not be greater than $2.0 \times EC_{BASE}$.

EC_{W02_base} = W02 base *energy* credit from Section 11.5.3

Cap_{HPWH} = heat-pump-only capacity at ~~50°F(10°C)~~ 80.6°F (27°C) entering air and 70°F (21°C) without supplemental *electric resistance* or *fossil fuel* heat, Btu/h

EndLoad = end-use peak hot-water load, excluding load for *heat trace* or recirculation, Btu/h

The heat-pump *service water heating system* shall comply with the following requirements:

1. For central *systems* with an installed total output capacity of more than 100,000 Btu/h at an ambient condition of 67.5°F (19.7°C) db, a preheat storage tank with ≥0.75 gal per 1000 Btu/h of design end-use *service water heating* requirements shall be heated only with heat-pump heating when the ambient temperature is >45°F (7.2°C)
2. For *systems* with *piping* temperature maintenance, either a *heat trace system* or a separate *water heater* in series for *recirculating system* and final heating shall be installed.
3. Heat-pump *water heater efficiency* shall meet or exceed one of the following:
   i. Output-capacity-weighted-average uniform *energy factor* (UEF) of 3.0 with a medium draw pattern in accordance with 10 CFR 430 Appendix E.
   ii. Output-capacity-weighted-average COP of not less than 4.0 tested at ~~50°F (10°C)~~ 80.6°F (27°C) entering air and 70°F (21°C) entering water in accordance with ~~AHRI Standard 1300~~Subpart G to 10 CFR Part 431.

Modify Tables 11.5.3-1 through 11.5.3-9 as shown.

Table 11.5.3-1 Energy Credits for Multifamily

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~16~~	~~17~~	~~20~~	~~20~~	~~24~~	~~25~~	~~30~~	~~29~~	~~36~~	~~33~~	~~33~~	~~39~~	~~36~~	~~36~~	~~41~~	~~35~~	~~37~~	~~37~~	~~38~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	13	13	16	15	22	20	20	21	27	15	24	19	14	19	25	12	13	11	3

Table 11.5.3-2 Energy Credits for Health Care Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2

Table 11.5.3-3 Energy Credits for Hotel/Motel

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~5~~	~~5~~	~~7~~	~~6~~	~~8~~	~~8~~	~~10~~	~~10~~	~~11~~	~~12~~	~~11~~	~~13~~	~~13~~	~~12~~	~~14~~	~~13~~	~~13~~	~~14~~	~~14~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	12	12	13	13	13	14	13	14	13	12	13	12	12	12	11	11	11	10	10

Table 11.5.3-4 Energy Credits for Office Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	2	2	3	3	3	3	3	4	3	3	4	3	3	3	4	3	3	3	3

Table 11.5.3-5 Energy Credits for Restaurant Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~2~~	~~3~~	~~3~~	~~3~~	~~4~~	~~5~~	~~6~~	~~6~~	~~7~~	~~8~~	~~7~~	~~9~~	~~9~~	~~9~~	~~10~~	~~9~~	~~10~~	~~10~~	~~10~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	10	10	11	11	11	12	10	12	12	9	11	9	8	9	8	7	8	7	5

Table 11.5.3-6 Energy Credits Retail Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~	~~2~~	~~2~~	~~2~~	~~3~~	~~2~~	~~2~~	~~3~~	~~2~~	~~2~~	~~3~~	~~2~~	~~2~~	~~2~~	~~2~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	2	2	3	2	3	3	3	2	4	2	2	2	2	2	1	2	2	1	1

Table 11.5.3-7 Energy Credits Education Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~2~~	~~3~~	~~3~~	~~3~~	~~3~~	~~3~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	2	2	3	3	3	3	3	3	4	3	3	3	2	3	3	2	2	2	2

Table 11.5.3-8 Energy Credits for Warehouses

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	3	2	4	3	4	3	2	3	7	1	2	1	0	1	1	0	0	0	0

Table 11.5.3-9 Energy Credits for Other Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
~~W02~~	~~Heat-Pump Water Heater~~	~~11.5.2.3.1(b)~~	~~4~~	~~4~~	~~4~~	~~4~~	~~5~~	~~6~~	~~7~~	~~6~~	~~8~~	~~8~~	~~7~~	~~9~~	~~8~~	~~8~~	~~9~~	~~8~~	~~9~~	~~9~~	~~9~~
W02	Heat-Pump Water Heater	11.5.2.3.1(b)	6	6	7	6	8	8	7	8	9	6	8	6	5	6	7	5	5	4	3

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

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.

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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.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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