



STANDARD

ANSI/ASHRAE Standard 40-2014
(Supersedes ANSI/ASHRAE 40-2002 [RA 2006])

Methods of Testing for Rating Heat Operated Unitary Air-Conditioning and Heat-Pump Equipment

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE Web site at www.ashrae.org/technology.

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FOREWORD

This is a revision of ASHRAE Standard 40-2002 (RA 2006). This standard was prepared under the auspices of ASHRAE. It may be used, in whole or in part, by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interests of obtaining uniform standards throughout the industry.

The changes made for the 2014 version include:

- The Scope in Section 2.3 was revised to remove specific mention of references and to clarify the intended scope
- The definition of “batch process” was revised to eliminate use of the term “cycle”
- Definitions were added for “electrically driven unitary air conditioners or heat pumps” and “heat-operated absorption chillers.” Definitions for “heat-operated” and “heat-operated unitary equipment” were revised
- Definitions for “section” and “sorber” were removed
- The unit conversions for temperature in the definitions for “standard air” and “standard temperature” were corrected
- Sections 4.c and 4.d were revised to improve clarity
- The title of ASHRAE Standard 37 was corrected in 5.1.d
- The capacity range of Sections 5.2.1, 5.2.2, and 14.1.2 was revised to more closely align with current industry classifications
- Section 5.2.2.1 was revised for clarity
- Section 5.2.3 was eliminated as it did not have enforceable requirements
- Section 5.3.1.1 was revised to increase the allowable heating value range for natural gas
- In Table 5.3.1 (previously Table 1), the SI units for heating value were corrected. The default heat value for natural gas was revised. The source reference was removed
- The wording of Sections 6.1.2, 6.6.2.4, 8.2, 9.2.3, 9.2.4, 10.3.2, 11.1.3, 11.2.4, and 12.1.4.1 were revised to use enforceable language
- Section 6.1.3 was eliminated as it did not have enforceable requirements
- The references in Section 6.5 were updated
- The footnotes from Section 6.6 were revised to direct the user to the correct portion of the standard
- Tables 10.3.2 (previously Table 4a and 4b) were relocated
- In Section 9.5.1, the definition of q_{thi} was revised

- The alternative requirements for airflow measurement in Section 10 were clarified. Additional alternative requirements are contained in the new 12.3.4
- Sections 10.4.1, 10.4.2, and 10.4.3 were revised for clarity
- The option to use mercury-in-glass-thermometers in Section 12.1.1 was removed
- The section that was previously numbered 12.1.4.1 was eliminated
- The suggested list of pressure measurement types was removed from Section 12.2.1
- Section 14.1.1.h was revised to stipulate that it applied to electrical power
- Section 16 references were updated and reorganized. References that are not required for compliance with the standard were removed
- Informative Annex A was revised to eliminate unnecessary material.

1. PURPOSE

1.1 This standard provides test methods for determining the heating and cooling output capacities and energy inputs of unitary air-conditioning and heat pump equipment that is heat-operated (see Section 3, “Definitions”).

1.2 These test methods may be used as a basis for rating such equipment, but it is not the purpose of this standard to specify methods of establishing ratings.

2. SCOPE

2.1 This standard applies to heat-operated unitary air conditioners and heat pumps consisting of one or more assemblies, including engine-driven systems. Where such equipment is provided in more than one assembly, the separate assemblies are designed to be used together.

2.2 Equipment within the scope of this standard may be classified as follows:

- a. Component arrangements:
 1. factory-assembled equipment employing heat-operated or mechanical refrigeration cycle or cycles (e.g., a packaged unit)
 2. equipment employing a heat-operated or mechanical refrigeration cycle with indoor and outdoor sections in separate assemblies (e.g., a split system)
 3. equipment employing a heat-operated or mechanical refrigeration cycle as a liquid chiller with cooling coil in separate assembly (e.g., chiller)
 4. equipment employing refrigeration cycles and heating functions (e.g., chiller/heater).
- b. Method of providing air circulation through indoor section:
 1. with circulating fan incorporated with indoor assembly
 2. without circulating fan, for use with separate fan or air handler, or with heating equipment incorporating a fan.