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ANSI/ASHRAE Standard 40-2025
Methods of Testing for Rating Heat-Operated Unitary Air-Conditioning and Heat-Pump Equipment

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Preview

NOTE

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

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FOREWORD

This 2025 revision substantially updates the standard. Additionally, this latest edition meets ASHRAE's mandatory language requirement.

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
c. Medium for heat transfer to or from the outdoors:
   1. Air
   2. Water (or brine)
   3. Evaporatively cooled condenser (cooling only)

2.3 This standard does not include methods of testing the following types of equipment:

a. Heat-operated absorption and engine-driven liquid chillers not part of a unitary air conditioner or heat pump
b. Electrically driven unitary air conditioners or heat pumps
c. Refrigerating systems employing the Peltier effect
d. Desiccant-based cooling systems

3. DEFINITIONS AND SYMBOLS

accuracy: the degree of conformity of an indicated value to the corresponding true value.

equivalent diameter: the diameter of a circle having the same area as a rectangular area.

error: the difference between the observed value of the measurand and its corresponding true value.

random error: the portion of the total error that varies randomly in repeated measurements of the true value throughout a test process.

systematic error: the portion of the total error that remains constant in repeated measurements of the true value throughout a test process.

true value: the unknown, error-free value of a test result.

uncertainty: the limits of error within which the true value lies.

unit under test (UUT): equipment that is the subject of performance testing.

Preview