



STANDARD

ANSI/ASHRAE Standard 118.2-2006 (RA 2015)
(Reaffirmation of ANSI/ASHRAE Standard 118.2-2006)

Method of Testing for Rating Residential Water Heaters

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NOTE

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FOREWORD

This test procedure is a revision of ANSI/ASHRAE Standard 118.2-1993, Method of Testing for Rating Residential Water Heaters.

Various changes were made to improve the clarity and consistency of the standard. Some material was moved to the appendices. Other changes were to require one pre-draw, to require a 24-hour soak-in period before the test, and to handle recovery periods that are preceded by multiple draws. The tolerances allowed in some measurements were reduced, and references to other standards were updated. The scope was changed to coordinate with ANSI/ASHRAE Standard 118.1-2003, Method of Testing for Rating Commercial Gas, Electric, and Oil Service Water Heating Equipment.

This update was initiated by Technical Committee 6.6, Service Water Heating, after a review by members of the committee. The document was developed following regular ASHRAE procedures for updating standards.

1. PURPOSE

The purpose of this standard is to provide test procedures for rating the efficiency and hot water delivery capabilities of directly heated residential water heaters.

2. SCOPE

This standard applies to the following:

- a. gas-fired water heaters with a self-contained, temperature-activated primary operating control and not requiring circulation of water for heating (Type I), with rated input no greater than 75,000 Btu/h (22 kW);
- b. oil-fired water heaters with a self-contained, temperature-activated primary operating control and not requiring circulation of water for heating (Type I), with rated input no greater than 105,000 Btu/h (30.8 kW);
- c. electric resistance water heaters with a primary self-contained, temperature-activated operating control and not requiring circulation of water for heating (Type I), with rated input no greater than 12 kW;
- d. gas-fired water heaters with a self-contained, flow-activated primary operating control and requiring water flow for heating (Type II), with rated input no greater than 200,000 Btu/h (58.6 kW);
- e. oil-fired water heaters with a self-contained, flow-activated primary operating control and requiring water flow for heating (Type II), with rated input no greater than 210,000 Btu/h (61.5 kW);
- f. electric resistance water heaters with a self-contained, flow-activated primary control and requiring water flow for heating (Type II), with rated input no greater than 12 kW;

- g. gas-fired water heaters with a remote temperature-activated primary operating control and requiring circulation through the heater for heating (Type III), with rated input no greater than 75,000 Btu/h (22 kW),
- h. oil-fired water heaters with a remote temperature-activated primary operating control and requiring circulation of water through the heater for heating (Type III), with rated input no greater than 105,000 Btu/h (30.7 kW);
- i. electric resistance water heaters with a remote temperature-activated operating control and requiring circulation through the heater for heating (Type III), with rated input no greater than 12 kW; and
- j. single-phase air-source heat-pump water heaters (Types IV and V), with rated input no greater than 6 kW.

3. DEFINITIONS

auxiliary electrical system: any electrical-energy-using components, such as a power burner, induced or forced-draft blower, or ignition system, supplied by the manufacturer as part of a gas-fired or oil-fired water heater.

cutout: the time when a water heater thermostat has acted to reduce to a minimum the energy or fuel input to the heat input device under its control.

efficiency, recovery: the efficiency of a tank-type water heater measured from the time a water draw initiates main burner operation until it ends, after a water draw has stopped.

heat-pump water heater: a water heater that uses a refrigeration cycle to extract heat from a source to heat water.

energy factor: the measure of overall efficiency in terms of energy output compared to energy consumption over a 24-hour cycle of use.

first-hour rating: the amount of hot water in gallons (liters) that the water heater can supply in an hour of operation by the method of test described in this standard.

input rating: except for heat-pump water heaters, the rating that appears on the water heater's rating plate, expressed in British thermal units per hour (Btu/h) or kilowatts (kW), as appropriate. For heat-pump water heaters, see Section 11.3.1.

mean tank temperature: the mean of the water temperatures determined using the water heater tank thermometry devices described in Section 7.3.1.

residential water heater: an appliance designed to produce heated water for applications requiring hot water at less than 180°F (82.2°C), which is within the input limitations stated in Section 2.

storage water heater: a water heater that heats and stores potable water within itself at a thermostatically controlled temperature for delivery on demand.

4. CLASSIFICATIONS

Residential water heaters are classified as follows:

- Water heaters in which the primary operating control is temperature-actuated are classified as Type I.
- Water heaters in which the primary operating control is flow-activated are classified as Type II.