

Australian/New Zealand Standard™

**Heat pump water heaters—Performance
assessment**

**Part 1: Air source heat pump water
heaters**



AS/NZS 5125.1:2014

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-028, Solar Water Heaters. It was approved on behalf of the Council of Standards Australia on 25 July 2014 and on behalf of the Council of Standards New Zealand on 11 July 2014.

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The following are represented on Committee CS-028:

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Australian Solar Cooling Interest Group
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Australian/New Zealand Standard™

Heat pump water heaters—Performance assessment

Part 1: Air source heat pump water heaters

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-028, Solar Water Heaters, to supersede AS/NZS 5125.1:2010. The performance evaluation procedure defined in this Standard has been designed to provide a means of evaluating the annual task performance of air source heat pump water heating systems. The main purpose of this revision is to introduce a performance test for assessing performance against minimum performance requirements for heat pump water heaters.

Testing of solar and heat pump water heating systems under outdoor conditions was specified in AS 2984—1987, *Solar water heaters—Method of test for thermal performance—Outdoor test method* (obsolescent Standard). Outdoor testing requires a long test period (8–10 weeks) due to the need to obtain stable inputs for a range of operating conditions. The major drawback of outdoor testing is that the tests must be repeated for every variation of system configuration offered by the supplier. The procedure defined in this Standard overcomes the time and cost limitations of using the outdoor test method in AS 2984.

The performance characteristics determined using this Standard are for the purpose of modelling annual performance in AS/NZS 4234, *Heated water systems—Calculation of energy consumption*, using the TRNSYS simulation program or equivalent software.

Statements expressed in mandatory terms in notes to figures and tables are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Heat pump water heaters—Performance assessment****Part 1: Air source heat pump water heaters**

SECTION 1 SCOPE AND APPLICATION

1.1 SCOPE

This Standard specifies the test conditions and test procedures for determining the energy performance characteristics of single-circuit air source heat pump water heaters. It applies to both stand-alone heat pump water heaters and heat pumps with the condenser integral with a storage tank. The variation of coefficient of performance (COP) and electric power used as a function of operating conditions are determined so that the results can be used in annual performance calculations of heat pump applications for sanitary hot water supply applications.

This Standard also specifies methods of testing and reporting the energy performance characteristics of electrical driven heat pumps using a single refrigeration circuit and having one evaporator and one condenser. Products with two evaporators that operate exclusively may also be tested in each mode.

The energy performance of a heat pump is determined by operating the product under a range of controlled environmental conditions and measuring the electrical power input and the thermal energy output in the form of hot water where the condenser is integral with a storage tank. Slightly different test procedures are specified for stand-alone and integral heat pump configurations.

This Standard also specifies a method for a 24 h tapping hot water load test for heat pumps to simulate domestic hot water usage behaviour under a range of controlled environmental conditions to determine a range of energy performance characteristics.

NOTE: This Standard uses the daily load profile of AS/NZS 4234.

1.2 APPLICATION

This Standard only addresses residential sanitary hot water supply.

This Standard does not apply to the testing of—

- (a) multiple split-system heat pumps;
- (b) units designed for dual heating and cooling tasks; or
- (c) heat pump water heater—solar boosted.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS 3498	Authorization requirements for plumbing products—Water heaters and hot-water storage tanks
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