AS/NZS 5125.1:2010

Australian/New Zealand Standard™

Heat pump water heaters—Performance assessment

Part 1: Air source heat pump water heaters

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 2 November 2010 and on behalf of the Council of Standards New Zealand on 12 November 2010.
This Standard was published on 23 December 2010.

The following are represented on Committee CS-028:

Australian Solar Energy Society
Australian Chamber of Commerce and Industry
Australian Industry Group
Chartered Institution of Building Services Engineers
Clean Energy Council
Department of Water and Energy, NSW
Electrical Compliance Testing Association
Energy Efficiency & Conservation Authority of New Zealand
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This Standard was issued in draft form for comment as DR AS/NZS 5125.

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First published as AS/NZS 5125.1:2010.

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, Private Bag 2439, Wellington 6140

ISBN 978 0 7337 9747 7

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-028, Solar Water Heaters. 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.

Testing of solar and heat pump water heating systems under outdoor conditions has been defined in AS 2984, *Solar water heaters—Methods of test for thermal performance—Outdoor test method*. 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 standard 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 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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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 use 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.

NOTE: The qualification requirements for low temperature classifications are specified in AS/NZS 2712.

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

2984 Solar water heaters—Methods of test for thermal performance—Outdoor test method

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

AS/NZS

2712 Solar and heat pump water heaters—Design and construction

4234 Heated water systems—Calculation of energy consumption