AS 5389:2019

Australian STANDARD

Space heating and cooling and ventilation systems — Calculation of energy and comfort performance

STANDARDS Australia

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Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Institute of Refrigeration Air Conditioning and Heating
Clean Energy Council
Clean Energy Regulator
Consumer Electronics Suppliers Association
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Preface

This Standard was prepared by the Standards Australia Committee CS-028, Solar Water Heaters, to supersede AS 5389(Int)—2013, *Solar heating and cooling systems — Calculation of energy consumption.*

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide a method for calculating energy consumption and determining the comfort performance of space heating and cooling systems and ventilator systems. It uses a combination of test results for component performance, mathematical models of representative buildings, and parameters for comfort condition. It includes methodologies for —

(a) calculating annual purchased energy use;

(b) calculating displaced purchased energy relative to reference heating and cooling devices; and

(c) determining comfort performance.

Statements in notes expressed in mandatory terms in text to 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 appendices 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 general

1.1 Scope

This Standard sets out a method for calculating energy consumption and determining the comfort performance of space heating and cooling systems and ventilator systems. It uses a combination of test results for component performance, mathematical models of representative buildings, and parameters for comfort condition. It includes methodologies for —

(a) calculating annual purchased energy use;

(b) calculating displaced purchased energy relative to reference heating and cooling devices; and

(c) determining comfort performance.

The method is applicable to products capable of space heating, cooling, or both; with or without sanitary water heating; and products capable of temperature and/or humidity controlled ventilation or heat exchange between zones of the building.

This Standard applies, but is not limited to —

(i) desiccant-based space heating and cooling systems;

(ii) solar air heating systems;

(iii) occupied space and roof ventilator systems; and

(iv) evaporative cooling systems.

These systems may also include water heating functions and/or be powered from onsite renewable energy sources such as photovoltaics.

This Standard includes —

(A) the method of defining space conditioning loads;

(B) the method of analysis and requirements for the presentation of results; and

(C) test methods for evaluating the performance of system components.

This Standard is applicable to hot water loads as defined in AS/NZS 4234 and heating and cooling capacities typical of single households and light commercial loads. For stand-alone solar and heat pump water heating systems, refer to AS/NZS 4234.

There are no product design or performance requirements in this Standard. System operating parameters specified in this Standard are only for the purpose of performance modelling.

Health and safety hazards arising from moving roof cavity air into occupied spaces are not addressed in this Standard. Direct air transfer from the roof cavity into occupied spaces shall satisfy the National Construction Code and AS 1668.2.[1]

1.2 Application

This Standard specifies procedures for determining the performance characteristics of domestic and commercial space cooling, heating and ventilation products, to assess seasonal and annual performance of products when fitted to domestic or commercial buildings. Annual performance analysis uses a mathematical model to assess annual energy consumption and comfort performance;