EBC

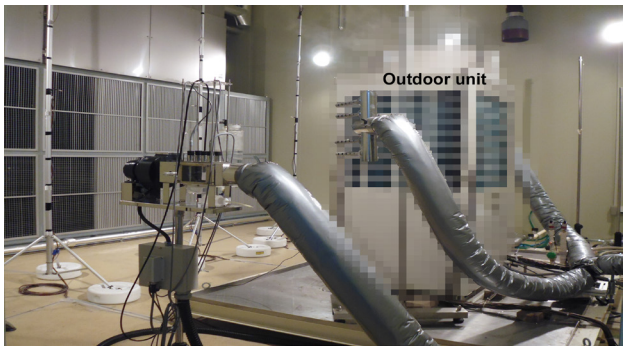
Energy in Buildings and Communities Programme

Factsheet

Evaluation and Demonstration of Actual Energy Efficiency of Heat Pump Systems in Buildings

EBC ANNEX 88

Heat pumps are regarded as a very promising form of energy efficient heat generator. However, publicly available information on the actual characteristics of heat pump systems in buildings is still insufficient to meet the needs of both system designers and product manufacturing engineers. There may be great potential to improve design practices and accuracy of energy calculation methods, which can be applied to strengthen building energy codes and regulations.



Outdoor unit of a variable refrigerant system during the load-based test without fixing compressor speed
Source: EBC Annex 88

PROJECT OBJECTIVES

1. developing literature review of test methods, monitoring methods and methods for energy calculations for heat pump systems, as well as existing design guidelines;
2. analysing and comparing existing proposals on testing methods of heat pump systems, and developing recommendations for testing actual energy efficiency;
3. developing manual on monitoring methods for energy efficiency and other characteristics of heat pump systems in buildings, and new data acquisition techniques on which to develop a database;
4. developing and validating alternative methods for predicting energy efficiency and energy use of heat pump systems in buildings under different conditions including partial load ratios, by utilising product information based on existing test standards and protocols, and
5. developing design guidelines for more energy efficient heat pump systems with demonstration data from applications in buildings.

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INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

EBC MISSION

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.

The following project deliverables are planned:

- a state of the art report on existing testing methods and monitoring methods, on methods and product parameters for estimating energy use by heat pump systems, and on existing design guidelines for heat pump systems (Report 1);
- recommendations of protocols to monitor actual characteristics and behaviour of heat pump systems (Report 2);
- recommendation of test methods and monitoring methods of heat pump systems (Report 3);
- database of monitoring results on heat pump systems in buildings (Report 4);
- design guidelines of heat pump systems in buildings based on the evaluation of energy use and efficiency (Report 5).

Project duration

Ongoing (2022 - 2027)

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Participating countries (provisional)

Australia, Brazil, Canada, P.R. China, Germany, Italy, Japan, The Netherlands, Switzerland

Further information

www.iea-ebc.org

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