
**Energy performance of buildings —
Method for calculation of system
energy requirements and system
efficiencies — Space emission systems
(heating and cooling)**

*Performance énergétique des bâtiments — Méthode de calcul des
besoins énergétiques et des rendements des systèmes — Systèmes
d'émission (de chaleur et de froid) dans les locaux*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document is part of a series aimed at international harmonization of the methodology for assessing the energy performance of buildings. Throughout, this series is referred to as a 'set of EPB standards'.

All EPB standards follow specific rules to ensure overall consistency, unambiguity and transparency.

All EPB standards provide a certain flexibility with regard to the methods, the required input data and references to other EPB standards, by the introduction of a normative template in [Annex A](#) and [Annex B](#) with informative default choices.

For the correct use of this document, a normative template is given in [Annex A](#) to specify these choices. Informative default choices are provided in [Annex B](#).

The framework for overall EPB includes:

- a) common terms, definitions and symbols;
- b) building and assessment boundaries;
- c) building partitioning into space categories;
- d) methodology for calculating the EPB (formulae on energy used, delivered, produced and/or exported at the building site and nearby);
- e) a set of overall formulae and input-output relations, linking the various elements relevant for the assessment of the overall EPB;
- f) general requirements for EPB dealing with partial calculations;
- g) rules for the combination of different spaces into zones;
- h) performance indicators;
- i) methodology for measured energy performance assessment.

The EPB series covers:

- a) energy performance calculation for heating systems;
- b) inspection of heating systems;
- c) design of heating systems;
- d) installation and commissioning of heating systems.

This document constitutes the specific part related to space heating and cooling emission, determining methods for calculation of energy losses/requirements of space heating and cooling systems, space cooling systems and domestic hot water systems in buildings.

This document specifies the structure for calculation of the additional heat and cooling losses and energy requirements of a heat and cooling emission systems for meeting the building net energy demand.

The calculation method is used for the following applications:

- calculation of the additional energy losses in the heat emission system or cooling system;
- optimisation of the energy performance of a planned heat emission system or cooling system, by applying the method to several possible options.

[Table 1](#) shows the relative position of this document within the set of EPB standards in the context of the modular structure as set out in ISO 52000-1.

NOTE 1 In ISO/TR 52000-2 the same table can be found, with, for each module, the numbers of the relevant EPB standards and accompanying technical reports that are published or in preparation.

NOTE 2 The modules represent EPB standards, although one EPB standard can cover more than one module and one module can be covered by more than one EPB standard, for instance a simplified and a detailed method respectively. See [Tables A.1](#) and [B.1](#).

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Table 1 — Position of this document (in casu M1-1-M1-3, M1-5, M1-7-M1-10), within the modular structure of the set of EPB standards

Overarching		Technical building systems														
Sub-module	Descriptions	Building (as such)		M1	M2	sub1	Descriptions	M3	M4	M5	M6	M7	M8	M9	M10	M11
		sub1	sub2													
1	General	1	General			1	General	EN 15316-1					EN 15316-1			
2	Common terms and definitions; symbols, units and subscripts	2	Building energy needs			2	Needs						EN 12831-3			
3	Applications	3	(Free) Indoor conditions without systems			3	Maximum load and power	EN 12831-1					EN 12831-3			
4	Ways to express energy performance	4	Ways to express energy performance			4	Ways to express energy performance	EN 15316-1					EN 15316-1			
5	Building categories and building boundaries	5	Heat transfer by transmission			5	Emission and control	EN 15316-2	EN 15316-2							
6	Building occupancy and operating conditions	6	Heat transfer by infiltration and ventilation			6	Distribution and control	EN 15316-3	EN 15316-3				EN 15316-3			
7	Aggregation of energy services and energy carriers	7	Internal heat gains			7	Storage and control	EN 15316-5					EN 15316-5 EN 15316-4-3			
8	Building zoning	8	Solar heat gains			8	Generation									
						8-1	Combustion boilers	EN 15316-4-1					EN 15316-4-1			
						8-2	Heat pumps	EN 15316-4-2	EN 15316-4-2				EN 15316-4-2			
						8-3	Thermal solar Photovoltaics	EN 15316-4-3					EN 15316-4-3			EN 15316-4-3
						8-4	On-site cogeneration	EN 15316-4-4					EN 15316-4-4			EN 15316-4-4
						8-5	District heating and cooling	EN 15316-4-5	EN 15316-4-5							EN 15316-4-5