

---

---

**Energy performance of buildings —  
Contribution of building automation,  
controls and building management —**

**Part 2:  
Explanation and justification of ISO  
52120-1**

*Performance énergétique des bâtiments — Impact de  
l'automatisation, de la régulation et de la gestion technique des  
bâtiments —*

*Partie 2: Explication et justification de l'ISO 52120-1*



This document is a preview generated by EUS



# **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Symbols and abbreviated terms</b>	<b>1</b>
4.1 Symbols	1
4.2 Abbreviated terms	1
<b>5 Method description</b>	<b>2</b>
5.1 Effect of building automation and control (BAC) and technical building management (TBM)	2
5.1.1 General	2
5.1.2 Control accuracy	2
5.1.3 Control function	3
5.1.4 Control strategy	4
5.2 Description of BAC functions	5
5.2.1 General	5
5.2.2 Heating control	5
5.2.3 Domestic hot water supply control	10
5.2.4 Cooling control	12
5.2.5 Ventilation and air conditioning control	17
5.2.6 Lighting control	22
5.2.7 Blind control	24
5.3 Method 1 - Impact of BAC and TBM on the energy performance of buildings (detailed method)	24
5.3.1 Rationale	24
5.3.2 Time steps	24
5.3.3 Assumptions	25
5.3.4 Data input	25
5.3.5 Simplified input	25
5.3.6 Calculation information	25
5.4 Method 2 - Impact of BAC and TBM on the energy performance of buildings (BACS factor method)	39
5.4.1 Rationale	39
5.4.2 Time steps	39
5.4.3 Calculation information	39
<b>6 Method selection</b>	<b>40</b>
<b>7 Worked out examples</b>	<b>41</b>
<b>8 Information on the accompanying spreadsheet</b>	<b>42</b>
<b>Bibliography</b>	<b>43</b>

## 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 247, *Building Automation, Controls and Building Management*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 52120 series can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

This document consolidates information that is considered important for users to properly understand, apply and nationally adapt the EPB standards.

The detailed technical rules in CEN/TS 16629 ask for a clear separation between normative and informative contents:

- to avoid flooding and confusing the actual normative part with informative content;
- to reduce the page count of the actual standard;
- to facilitate understanding of the package.

Therefore, it is important that each EPB standard is accompanied by an informative technical report, like this document, where all informative contents are collected. [Table 1](#) shows the relative position of this document within the EPB set of standards.

Table 1 — Position of this document within the EPB set of standards

Over-arching			Technical building system									
Sub module	Descriptions	Building (as such)	Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic hot waters	Lighting	Building automation and control	PV, wind...
sub1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	
1	General	General	General									
2	Common terms and definitions; symbols, units and subscripts	Building energy needs	Needs									
3	Application	(Free) Indoor conditions without systems	Maximum load and power									
4	Ways to express energy performance	Ways to express energy performance	Ways to express energy performance							x		
5	Building functions and building boundaries	Heat transfer by transmission	Emission and control							x		
6	Building occupancy and operating conditions	Heat transfer by infiltration and ventilation	Distribution and control							x		
7	Aggregation of energy services and energy carriers	Internal heat gains	Storage and control							x		
8	Building partitioning	Solar heat gains	Generation and control							x		
9	Calculated energy performance	Building dynamics (thermal mass)	Load dispatching and operating conditions							x		
10	Measured energy performance	Measured energy performance	Measured energy performance							x		
11	Inspection	Inspection	Inspection									
12	Ways to express indoor comfort		BMS									
13	External environment conditions											
14 <sup>a</sup>	Economic calculation											

The shaded modules are not applicable.

<sup>a</sup> The shaded modules are not applicable.

# Energy performance of buildings — Contribution of building automation, controls and building management —

## Part 2: Explanation and justification of ISO 52120-1

### 1 Scope

This document contains information to support the correct understanding, use and adoption of ISO 52120-1.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 52120-1, *Energy performance of buildings — Contribution of building automation, controls and building management — Part 1: General framework and procedures*

ISO 7345, *Thermal performance of buildings and building components — Physical quantities and definitions*

ISO 52000-1, *Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345, ISO 52000-1 and ISO 52120-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 4 Symbols and abbreviated terms

#### 4.1 Symbols

For the purposes of this document, the symbols given in ISO 52000-1 and ISO 52120-1 apply.

#### 4.2 Abbreviated terms

For the purposes of this document, the abbreviations in ISO 52120-1 apply.