SLOVENSKI STANDARD
SIST EN 16947-1:2018

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Energijske lastnosti stavb - Sistem upravljanja stavb - 1. del: Modul M10-12

Energy Performance of Buildings - Building Management System - Part 1: Module M10-12

Energieeffizienz von Gebäuden - Gebäudemanagementsystem - Teil 1: Modul M10-12

Performance énergétique des bâtiments - Système de gestion technique des bâtiments - Partie 1 : Module M10-12

Ta slovenski standard je istoveten z: EN 16947-1:2017

ICS:

35.240.67	Uporabniške rešitve IT v gradbeništvu	IT applications in building and construction industry
97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

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Energy Performance of Buildings - Building Management System - Part 1: Module M10-12

Performance énergétique des bâtiments - Système de gestion technique des bâtiments - Partie 1 : Module M10-12

Energieeffizienz von Gebäuden - Gebäudemanagementsystem - Teil 1: Module M10-12

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16947-1:2017) has been prepared by Technical Committee CEN/TC 247 “Building Automation, Controls and Building Management”, the secretariat of which is held by SNV.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2017 and conflicting national standards shall be withdrawn at the latest by November 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document is part of the set of standards on the energy performance of buildings (the set of EPB standards) and has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/480, [8]), and supports essential requirements of EU Directive 2010/31/EC on the energy performance of buildings (EPBD, [9]).

In case this standard is used in the context of national or regional legal requirements, mandatory choices may be given at national or regional level for such specific applications, in particular for the application within the context of EU Directives transposed into national legal requirements.

Further target groups are users of the voluntary common European Union certification scheme for the energy performance of non-residential buildings (EPBD art.11.9) and any other regional (e.g. Pan European) parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This standard is part of a series of standards aiming at international harmonization of the methodology for the assessment of the energy performance of buildings, called “EPB set of standards”.

As part of the “EPB set of standards” it complies with the requirements for the set of basic EPB documents EN ISO 52000-1:2017 (see Normative references), CEN/TS 16628 and CEN/TS 16629 (see bibliography [2] and [3]) developed under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/480), and supports essential requirements of EU Directive 2010/31/EU on the energy performance of buildings (EPBD).

The standards issued by TC 247 for M/480 belong to the EPB set of standards and are in line with the over-arching standard (EN ISO 52000-1:2017) and drafted in accordance with the basic principles and detailed technical rules developed in the Phase I of the mandate.

Also these standards are clearly identified in the modular structure developed to ensure a transparent and coherent EPB standard set. BAC (Building Automation and Control) is identified in the modular structure as Technical Building System M10. However, the standards of TC 247 deal with control accuracy, control functions and control strategies using standards communications protocol (these last standards do not belong to the EPB standards set).

To avoid a duplication of calculation due to the BAC (avoid double impact), no calculation are done in BAC EPB standard set, but in each underlying standard of EPB set of standards (from M1 to M9 in the Modular Structure), an IDENTIFIER developed and present in the M10 covered by EN 15232-1 is used where appropriate. These way of interaction is described in detailed in the Technical Report (CEN ISO/TR 52000-2:2017) accompanying the over-arching standard. As consequence, the Annex A and Annex B concept as EXCEL sheet with the calculation formulas used in the EPB standards are not applicable for the standards issued by TC 247 for M/480.

The main target groups of this standard are all the users of the set of EPB standards (e.g. architects, engineers, regulators).

Further target groups are parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

More information is provided in the Technical Report accompanying this standard (CEN/TR 16947-2:2016 [1]).

1 Scope

This European Standard specifies operational activities, overall alarming, fault detection and diagnostics, reporting, monitoring, energy management functions, functional interlocks and optimizations to set and maintain energy performance of buildings.

Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1:2017.

NOTE 1 In CEN ISO/TR 52000-2:2017 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 may cover more than one module and one module may be covered by more than one EPB standard, for instance a simplified and a detailed method respectively.

Table 1 — Position of this standard (in casu M10–12), within the modular structure of the set of EPB standards

	Over-arching	Building (as such)	Technical Building System									
Submodule	Descriptions	Descriptions	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									
5	Building Functions and Building Boundaries	Heat Transfer by Transmission	Emission and control									
6	Building Occupancy and Operating Conditions	Heat Transfer by Infiltration and Ventilation	Distribution and control									
7	Aggregation of Energy Services and Energy Carriers	Internal Heat Gains	Storage and control									
8	Building Partitioning	Solar Heat Gains	Generation and control									
9	Calculated Energy Performance	Building Dynamics (thermal mass)	Load dispatching and operating conditions									
10	Measured Energy Performance	Measured Energy Performance	Measured Energy Performance									
11	Inspection	Inspection	Inspection									
12	Ways to Express Indoor Comfort		BMS								x	
13	External Environment Conditions											
14[a]	Economic Calculation											

a The shaded modules are not applicable.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 52000-1:2017, *Energy performance of buildings - Overarching EPB assessment - Part 1: General framework and procedures (ISO 52000-1:2017)*

EN ISO 52016-1, *Energy performance of buildings - Calculation of the energy needs for heating and cooling, internal temperatures and heating and cooling load in a building or building zone - Part 1: Calculation procedures (ISO 52016-1)*

EN 15232-1:2017, *Energy Performance of Buildings - Energy performance of buildings - Part 1: Impact of Building Automation, Controls and Building Management - Modules M10-4,5,6,7,8,9,10*

EN 15316-2, *Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 2: Space emission systems (heating and cooling), Module M3-5, M4-5*

EN 15316-3, *Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 3: Space distribution systems (DHW, heating and cooling), Module M3-6, M4-6, M8-6*

EN 15316-4-4, *Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-4: Heat generation systems, building-integrated cogeneration systems, Module M8-3-4, M8-8-4, M8-11-4*

EN ISO 7345:1995, *Thermal insulation - Physical quantities and definitions (ISO 7345:1987)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 7345:1995 and EN ISO 52000-1:2017 and the following apply.

3.1
building management system
BMS
products, software, and engineering services for automatic controls (including interlocks), monitoring and optimization, human intervention, and management to achieve energy-efficient, economical, and safe operation of building services equipment

Note 1 to entry: Building services is divided in technical, infrastructural and financial building services and energy management is part of technical building management.

Note 2 to entry: Building energy management system is part of a BMS.

Note 3 to entry: Building energy management system comprising data collection, logging, alarming, reporting, and analysis of energy usage etc. The system is designed to reduce the energy consumption, improve the utilization, increase the reliability, and predict the performance of the technical building systems, as well as optimize energy usage and reducing its cost.

3.2
technical building management
process(es) and services related to operation and management of buildings and technical building system through the interrelationships between the different disciplines and trades

Note 1 to entry: The disciplines and trades comprise all technical building services for the purpose of optimized maintenance and energy consumption.

EXAMPLE Optimization of buildings through interrelationships ranging from heating, ventilation and air conditioning (HVAC) to lighting and day lighting to life safety and security to electric power systems and energy monitoring and metering; to its services, including communications and maintenance and to its management.

4 Symbols and subscripts

4.1 Symbols

For the purposes of this document, the symbols given in Clause 4 and Annex C of EN ISO 52000-1:2017 and the specific symbols listed in Table 2 apply.

Table 2 — Symbols and units

Symbol	Quantity	Unit
β	Load factor	-

4.2 Subscripts

For the purposes of this document, the subscript given in Clause 4 and Annex C of EN ISO 52000-1:2017, and the specific subscripts listed in Table 3 apply.

Table 3 — Subscripts

Subscript	Term
BMS	building management system
boil	boiler
cgn	cogeneration
cmb	combustion

5 Description of the methods

5.1 Output of the method

This method covers the calculation of the building operation data that could be influenced and optimized by a building management system. Those data are mainly related to:

— setpoint including set back,

— operation times of heating, ventilation, cooling and lighting systems including start-stop-optimization,

— sequencing of multiple generators,

— building energy management and load management with regard to the utilization of local renewable energy and local energy production,

— heat recovery and heat shifting,

— smart grid interactions, demand side management, and peak shaving.