SLOVENSKI STANDARD
oSIST prEN 15232-1:2016

01-januar-2016

Energijske lastnosti stavb - 1. del: Vpliv avtomatizacije stavb in izvršnih elementov ter upravljanja stavb - Moduli M10-4, 5, 6, 7, 8, 9, 10

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

Energieeffizienz von Gebäuden - Teil 1: Einfluss von Gebäudeautomation und Gebäudemanagement - Module M10-4, 5, 6, 7, 8, 9, 10

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ICS:

27.010	Prenos energije in toplote na splošno	Energy and heat transfer engineering in general
97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 15232-1

December 2015

ICS 35.240.99; 91.120.10; 97.120

Will supersede EN 15232:2012

English Version

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

Performance énergétique des bâtiments - Partie 1 : Impact de l'automatisation, de la régulation et de la gestion technique - Modules M10-4, 5, 6, 7, 8, 9, 10

Energieeffizienz von Gebäuden - Teil 1: Einfluss von Gebäudeautomation und Gebäudemanagement - Module M10-4, 5, 6, 7, 8, 9, 10

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 247.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (prEN 15232-1:2015) has been prepared by Technical Committee CEN/TC 247 "Building Automation, Controls and Building Management", the secretariat of which is held by SNV.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15232:2012.

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

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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 prEN ISO 52000-1:2015 (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/EC 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 (prEN ISO 52000-1:2015) 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 don't 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 is used where appropriate. These way of interaction is described in detailed in the Technical Report (prCEN ISO/TR 52000-2) 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.

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Table 1 — Position of this standard within the EPB set of 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								x	

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	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
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	Economic Calculation											

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1 Scope

This European Standard specifies:

— a structured list of control, building automation and technical building management functions which contribute to the energy performance of buildings;

— a method to define minimum requirements regarding the control, building automation and technical building management functions to be implemented in buildings of different complexities;

— factor based method to get a first estimation of the effect of these functions on typical buildings types and use profiles;

— detailed methods to assess the effect of these functions on a given building.

These methods enable to introduce the contribution of these functions to the calculations of energy performance ratings and indicators calculated by the relevant standards - controls related identifiers for technical building systems.

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.

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EN 13779, *Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems*

EN ISO 13790:2008, *Energy performance of buildings - Calculation of energy use for space heating and cooling (ISO 13790:2008)*

prEN 15193-1:2015, *Energy performance of buildings - Energy requirements for lighting*

EN 15217:2007, *Energy performance of buildings - Methods for expressing energy performance and for energy certification of buildings*

EN 15241, *Ventilation for buildings - Calculation methods for energy losses due to ventilation and infiltration in commercial buildings*

EN 15243:2007, *Ventilation for buildings - Calculation of room temperatures and of load and energy for buildings with room conditioning systems*

EN 15255:2007, *Energy performance of buildings - Sensible room cooling load calculation - General criteria and validation procedures*

prEN 15316-2:2015, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 2: Space heating emission systems (heating and cooling)*

prEN 15316-3:2015, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 3: Space distribution systems (DHW, heating and cooling)*

prEN 15316-4-1:2015, *Heating systems and water based cooling systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass)*

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prEN 15316-4-2:2015, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-2: Space heating generation systems, heat pump systems*

prEN 15316-4-3:2015, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-3: Heat generation systems, thermal solar and photovoltaic systems*

prEN 15316-4-4:2015, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-4: Heat generation systems, building-integrated cogeneration systems*

prEN 15316-4-5:2007, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-5: District heating and cooling*

prEN 15316-4-6:2015, *Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 4-6: Heat generation systems, photovoltaic systems*

EN ISO 16484-3, *Building automation and control systems (BACS) - Part 3: Functions*

prEN 16798-3:2015, *Energy performance of buildings - Part 3: Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems*

EN ISO 50001:2011, *Energy management systems - Requirements with guidance for use (ISO 50001:2011)*

prEN ISO 52000-1:2015, *Energy performance of buildings – Overarching EPB assessment – Part 1: General framework and procedures*

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

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3 Terms and definitions

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For the purposes of this document, the terms and definitions given in EN ISO 7345:1995, prEN ISO 52000-1:2015, and the following apply.

3.1
auxiliary energy
electrical energy used by technical building systems to support energy transformation to satisfy energy needs

Note 1 to entry: This includes energy for fans, pumps, electronics etc., Electrical energy input to the ventilation system for air transport and heat recovery is not considered as auxiliary energy, but as energy use for ventilation.

Note 2 to entry: In EN ISO 9488 the energy used for pumps and valves is called “parasitic energy”.

[SOURCE: prEN ISO 52000-1:2015]

3.2
building automation and control
BAC
products, software, and engineering services for automatic controls, monitoring and optimization, human intervention, and management to achieve energy-efficient, economical, and safe operation of building services equipment

[SOURCE: prEN ISO 52000-1:2015]

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3.3
building automation and control system
BACS
system, comprising all products and engineering services for automatic controls (including interlocks), monitoring, optimization, for operation, human intervention, and management to achieve energy – efficient, economical, and safe operation of building services

Note 1 to entry: The use of the word 'control' does not imply that the system/device is restricted to control functions. Processing of data and information is possible.

Note 2 to entry: If a building control system, building management system, or building energy management system complies with the requirements of the EN ISO 16484 standard series, it should be designated as a building automation and control system (BACS).

[SOURCE: EN ISO 16484-2:2004]

3.4
building management
BM
totality of services involved in the management operation and monitoring of buildings (including plants and installations). Building management can be assigned as part of facility management

[SOURCE: CEN/TS 15379:2006]

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3.5
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

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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.

3.6
control function
BAC effect of programs and parameters

Note 1 to entry: BAC functions are referred to as control functions, I/O, processing, optimization, management and operator functions. They are listed in the BAC FL (function list) for a specification of work.

Note 2 to entry: Function is a program unit that delivers exactly one data element, which can be a multiple value (i.e. an array or a structure). Functions can be an operand in a program. [EN 61131–3:2003]

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3.7
delivered energy
energy, expressed per energy carrier, supplied to the technical building systems through the assessment boundary, to satisfy the uses taken into account or to produce the exported energy

Note 1 to entry: Delivered energy can be calculated for defined energy uses or it can be measured.

[SOURCE: prEN ISO 52000-1:2015]

3.8
energy carrier
substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes

[SOURCE: prEN ISO 52000-1:2015]

3.9
energy need for heating or cooling
heat to be delivered to or extracted from a thermally conditioned space to maintain the intended space temperature conditions during a given period of time

Note 1 to entry: The energy need can include additional heat transfer resulting from non-uniform temperature distribution and non-ideal temperature control, if they are taken into account by increasing (decreasing) the effective temperature for heating (cooling) and not included in the heat transfer due to the heating (cooling) system.

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3.10
energy use for space heating or cooling or domestic hot water
energy input to the heating, cooling or hot water system to satisfy the energy need for heating, cooling (including dehumidification) or domestic hot water respectively

[SOURCE: prEN ISO 52000-1:2015]

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3.11
energy efficiency
ratio between an output of performance, service, goods or energy, and an input of energy

Note 1 to entry: Both input and output need to be accurately defined in quantity and quality, and be measurable.

Note 2 to entry: Energy efficiency is commonly used with the meaning of “Optimum Energy Efficiency”, namely: “to operate (an entity) with minimum energy consumption”.

Note 3 to entry: Commonly used sense of energy efficiency is doing at least the same with less energy.

[SOURCE: CEN/CLC/TR 16103]

3.12
energy efficiency improvement
increase in energy efficiency as a result of technological, behavioural and/or economic changes

[SOURCE: CEN/CLC/TR 16103]

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3.13
energy use
manner or kind of application of energy

EXAMPLE Lighting, ventilation, heating, processes, transport.

Note 1 to entry: The quantity of the energy applied is expressed as energy consumption.

[SOURCE: CEN/CLC/TR 16103]

3.14
integrated building automation and control systems
BACS designed to be interoperable and with the ability to be connected to one or more specified 3rd party building automation and control devices/systems through open data communication network or interfaces performed by standardized methods, special services and permitted responsibilities for system integration

EXAMPLE Interoperability between 3rd party BACS devices/systems for HVAC, domestic hot water, lighting, electrical power distribution, energy metering, elevators and escalators, other plants, as well as systems for communications, access control, security, life safety etc

3.15
integrated function
BAC effect of programs, shared data points and parameters for multi-discipline interrelationships between various building services and technologies

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3.16
measured energy rating
energy performance based on measured amounts of delivered and exported energy

Note 1 to entry: The measured rating is the weighted sum of all energy carriers used by the building, as measured by meters or derived from measured energy by other means. It is a measure of the in-use performance of the building after correction or extrapolation. This is particularly relevant to certification of actual energy performance.

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Note 2 to entry: Also known as “operational rating”.

[SOURCE: prEN ISO 52000-1:2015]

3.17
set-point temperature of a conditioned zone
internal (minimum) temperature, as fixed by the control system in normal heating mode, or internal (maximum) temperature, as fixed by the control system in normal cooling mode

Note 1 to entry: The corrected value of a temperature set point is used for the calculation of energy performance. It enables the impact of the accuracy of the control system on the energy performance to be taken into account.

3.18
thermally activated building systems
TABS
massive building fabric actively heated or cooled by integrated air or water based systems