BSI Standards Publication

Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies

Part 4-3: Heat generation systems, thermal solar and photovoltaic systems, Module M3-8-3, M8-8-3, M11-8-3

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National foreword

This British Standard is the UK implementation of EN 15316-4-3:2017. It supersedes BS EN 15316-4-3:2007 and BS EN 15316-4-6:2007, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/24, Heating systems and water based cooling systems in buildings.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Performance énergétique des bâtiments - Méthode de calcul des besoins énergétiques et des rendements des systèmes - Partie 4-3 : Systèmes de génération de chaleur, systèmes solaires thermiques et systèmes photovoltaïques, Module M3-8-3, M8-8-3, M11-8-3

Energetische Bewertung von Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 4-3: Wärmeerzeugungssysteme, thermische Solaranlagen und Photovoltaikanlagen, Modul M3-8-3, M8-8-3, M11-8-3

This European Standard was approved by CEN on 27 February 2017.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 15316-4-3:2017) has been prepared by Technical Committee CEN/TC 228 “Heating systems and water based cooling systems in buildings”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.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 supersedes EN 15316-4-3:2007 and EN 15316-4-6:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives 2010/30/EU and 2009/125/EC.

For relationship with EU Directives, see informative Annexes ZA, ZB, and ZC, which are integral parts of this document.

The main changes compared to EN 15316-4-3:2007 and EN 15316-4-6:2007 are:

a) extensions to the former Method B, e.g. full support of solar systems with integrated back-up heating and extension with the effect of the heat storage heat losses;

b) method 3 is added to broaden the applicability of the solar thermal methods to calculations with an hourly time step;

c) the revision brings the method in conformity with the methods used in Ecodesign and the energy labelling (CEN mandate 495);

d) addition of a new method to support input with an hourly time step; and

e) editorial changes.

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 European Standard is part of a set of standards developed to support the EPBD[1] implementation, hereafter called “EPB standards”.

EPB standards deal with energy performance calculation and other related aspects (like system sizing) to provide the building services considered in the EPBD.

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 standard, a normative template is given in Annex A to specify these choices. Informative default choices are provided in Annex B.

— Where appropriate, the method(s) in each of the EPB standards may provide simplified procedures and/or default values as alternative options. Without further specification, these simplified procedures and/or default values may be used without restricting criteria.

NOTE 1 For instance because these are conservative procedures or values.

The term 'default values' should not be confused with 'informative values'. If the values are given in the normative part of the standard, they are normative values. See also next options.

— In other cases, these simplified procedures and/or default values may be intended to be used only for situations where there is limited information. This may be the case in existing buildings with limited possibilities to acquire all input data. In particular when the EPB set of standards is used in the context of national or regional building regulations, specific criteria when the simplified method and/or default data are allowed, may be given at national or regional level, following the template in Annex A. Annex B provides (informative) default choices.

Use by or for regulators: In case the 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. These choices (either the informative default choices from Annex B or choices adapted to national / regional needs, but in any case following the template of this Annex A) can be made available as national annex or as separate (e.g. legal) document (national data sheet).

NOTE 2 So in this case:

— the regulators will **specify** the choices;

— the individual user will apply the standard to assess the energy performance of a building, and thereby **use** the choices made by the regulators.

Topics addressed in this standard can be subject to public regulation. Public regulation on the same topics can override the default values in Annex B of this standard. Public regulation on the same topics can even, for certain applications, override the use of this standard. Legal requirements and choices are in general not published in standards but in legal documents. In order to avoid double publications and difficult updating of double documents, a national annex may refer to the legal texts where national choices have been made by public authorities. Different national annexes or national data sheets are possible, for different applications.

1 Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)

It is expected, if the default values, choices and references to other EPB standards in Annex B are not followed due to national regulations, policy or traditions, that:

— national or regional authorities prepare data sheets containing the choices and national or regional values, according to the model in Annex A. In this case, the national annex (e.g. NA) refers to this text;

— or, by default, the national standards body will consider the possibility to add or include a national annex in agreement with the template of Annex A, in accordance to the legal documents that give national or regional values and choices.

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 (prCEN/TR 15616-6-6, under preparation).

The subjects covered by CEN/TC 228 are the following:

— design of heating systems (water based, electrical etc.);

— installation of heating systems;

— commissioning of heating systems;

— instructions for operation, maintenance and use of heating systems;

— methods for calculation of the design heat loss and heat loads;

— methods for calculation of the energy performance of heating systems.

Heating systems also include the effect of attached systems such as hot water production systems.

All these standards are systems standards, i.e. they are based on requirements addressed to the system as a whole and not dealing with requirements to the products within the system.

Where possible, reference is made to other European or International Standards. However, use of products complying with relevant product standards is no guarantee of compliance with the system requirements.

The requirements are mainly expressed as functional requirements, i.e. requirements dealing with the function of the system and not specifying shape, material, dimensions or the like.

The guidelines describe ways to meet the requirements, but other ways to fulfil the functional requirements might be used if fulfilment can be proved.

Heating systems differ among the member countries due to climate, traditions and national regulations. In some cases, requirements are given as classes so national or individual needs may be accommodated.

In cases where the standards contradict with national regulations, the latter should be followed.

This standard (EN 15316-4-3) gives six methods to take into account the energy performance of solar systems for heating of domestic hot water, space heating and electricity production.

The methods 1 to 3 address solar thermal applications.

— Method 1 is valid for the generation of heat for domestic hot water production, using system performance data in conformity with product standards.

— Method 2 is valid for the generation of heat for domestic hot water production and/or space heating with a time step of one month, using component data in conformity with product standards.

— Method 3 is valid for the generation of heat for domestic hot water production and/or space heating with a time step of one hour, using component data in conformity with product standards.

The methods 4 to 6 address photovoltaic systems.

— Method 4 is valid for calculation of the electricity production of photovoltaic systems, with a time step of one year, using component data in conformity with product standards.

  Only the calculation method and the accompanying input parameters are normative. All values required to parameter the calculation method should be given in a national annex, containing appropriate national values corresponding to the tables given in Annex C.

— Method 5 is valid for calculation of the electricity production of photovoltaic systems, with a time step of one month, using component data in conformity with product standards. It represents the translation of the yearly method 4 to a monthly base.

— Method 6 is valid for calculation of the electricity production of photovoltaic systems, with a time step of one hour.

1 Scope

This European Standard specifies the:

— required inputs;

— calculation method;

— required and resulting outputs,

for heat generation systems, thermal solar systems (for space heating, domestic hot water production and the combination of both) and for photovoltaic systems applied in buildings.

Within this standard, 6 methods are specified each method has its own range of applicability.

— Method 1,

  is applicable for solar domestic hot water systems characterized by the EN 12976 series (factory made) or EN 12977-2 (custom built).

  The main output of the method is the solar heat and back up heat contribution to the requested heat use.

— Method 2,

  is applicable for systems for domestic hot water and / or space heating with components characterized by EN ISO 9806 and EN 12977-3 or EN 12977-4 with a monthly calculation time step.

  The main output of the method is the solar heat and back up heat contribution to the requested heat use.

— Method 3,

  is applicable for systems for domestic hot water and / or space heating with components characterized by EN ISO 9806 with an hourly calculation time step.

  The main output of the method is collector loop heat supplied to the heat storage.

— Method 4,

  is applicable for photovoltaic systems with components characterized by standards and with an annual calculation time step.

  The output of the method is the produced electricity.

— Method 5,

  is applicable for photovoltaic systems with components characterized by standards and with a monthly calculation time step.

  The output of the method is the produced electricity.

— Method 6,

  is applicable for photovoltaic systems with components characterized by standards and with a calculation time step.