BS EN 15316-4-4:2017

BSI Standards Publication

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

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National foreword

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 It supersedes BS EN 15316-4-4:2007, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/24, Central heating installations.

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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Compliance with a British Standard cannot confer immunity from legal obligations.

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Energetische Bewertung von Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 4-4: Wärmeerzeugungssysteme, gebäudeintegrierte KWK-Anlagen, Modul M8-3-4, M8-8-4, M8-11-4

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

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Full document details: BS EN 15316-4-4:2017

Contents

Page

European foreword ... 3
Introduction ... 4
1 Scope ... 6
2 Normative references ... 8
3 Terms and definitions ... 9
4 Symbols and abbreviations ... 12
4.1 Symbols ... 12
4.2 Subscripts ... 12
5 Description of the method ... 13
5.1 Output of the method ... 13
5.2 General description of the method ... 13
6 Description of CHP system calculation ... 13
6.1 Output data ... 13
6.2 Calculation time step ... 14
6.3 Input data ... 14
6.4 Calculation procedure – load profile method ... 17
7 Quality control ... 22
8 Compliance check ... 22
Annex A (normative) Input data - Product data ... 23
A.1 Product description data (quantitative) ... 23
A.2 Product technical data (default values) ... 23
A.3 System design data ... 24
Annex B (informative) Input data - Product data ... 25
B.1 Product description data (quantitative) ... 25
B.2 Product technical data (default values) ... 25
B.3 System design data ... 26
Bibliography ... 27

Documents
Document Sharing Hub
Full document details: BS EN 15316-4-4:2017

European foreword

This document (EN 15316-4-4:2017) 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 document supersedes EN 15316-4-4:2007.

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 October 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

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

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

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Introduction

This standard is part of a package developed to support EPBD[1]implementation, hereafter called "EPB standards". It supports also EED[2] implementation.

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

CEN/TC 228 deals with heating systems in buildings. Subjects covered by CEN/TC 228 are:

— energy performance calculation for heating systems;

— inspection of heating systems;

— design of heating systems;

— installation and commissioning of heating systems.

This standard specifies a method for calculation of the system energy losses and the energy performance of building-integrated cogeneration systems.

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 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).

[2] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency.

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Full document details: BS EN 15316-4-4:2017

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 (CEN/TR 15316-6-7).

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Full document details: BS EN 15316-4-4:2017

1 Scope

This European Standard defines a method for the performance assessment of building-integrated cogeneration units by the calculation of the electricity production, useful heat output and recoverable losses. Such units are commonly known as micro or small scale cogeneration, or micro or small scale CHP.

A building-integrated cogeneration, is a cogeneration unit installed to supply space heating, domestic hot water and possibly cooling within a building. It could operate as the only heating/cooling appliance of the building or in combination with other heat generators, such as boilers or electrical chillers. Unlike district heating systems, where heat and electricity are generated at central plants and transmitted through networks to a number of remote buildings, a building-integrated cogeneration unit produces useful heat for uses within the building. The electricity produced by the integrated cogeneration unit may be used within the building or may be exported.

This standard deals with heat generators for heating or for combined domestic hot water and heating services.

The calculation is based on the performance characteristics of the units, defined in product standards, and on operation conditions such the needed heat output.

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.

NOTE 1 In CEN 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 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. See also Clause 2 and Tables A.1 and B.1.

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Full document details: BS EN 15316-4-4:2017

Table 1 — Position of this standard, within the modular structure of the set of EPB standards

Overarching			Building (as such)		Technical Building Systems										
	Descriptions			Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic Hot water	Lighting	Building automation and control	Electricity production
sub1		**M1**	**sub1**	**M2**	**sub1**		**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**
1	General		**1**	General	**1**	General	15316–1					15316–1			
2	Common terms and definitions; symbols, units and subscripts		**2**	Building Energy Needs	**2**	Needs						12831–3 ?			
3	Applications		**3**	(Free) Indoor Conditions without Systems	**3**	Maximum Load and Power	12831–1					12831–3			
4	Ways to Express Energy Performance		**4**	Ways to Express Energy Performance	**4**	Ways to Express Energy Performance	15316–1					15316–1			
5	Building Functions and Building Boundaries		**5**	Heat Transfer by Transmission	**5**	Emission and control	15316–2	15316–2							
6	Building Occupancy and Operating Conditions		**6**	Heat Transfer by Infiltration and Ventilation	**6**	Distribution and control	15316–3	15316–3				15316–3			
7	Aggregation of Energy Services and Energy Carriers		**7**	Internal Heat Gains	**7**	Storage and control	15316–5					15316–5 15316–4-3			
8	Building Partitioning		**8**	Solar Heat Gains	**8**	Generation									
					8–1	Combustion boilers	15316–4-1					15316–4-1			
					8–2	Heat pumps	15316–4-2	15316–4-2				15316–4-2			
					8–3	Thermal solar Photovoltaics	15316–4-3					15316–4-3			15316–4-3
					8–4	On-site cogeneration	**15316–4-4**					**15316–4-4**			**15316–4-4**
					8–5	District heating and cooling	15316–4-5	15316–4-5							15316–4-5
					8–6	Direct electrical heater	15316–4-9					15316–4-9			
					8–7	Wind turbines									15316–4-10
					8–8	Radiant heating, stoves	15316–4-8								
9	Calculated Energy Performance		**9**	Building Dynamics (thermal mass)	**9**	Load dispatching and operating conditions	15316–1								
10	Measured Energy Performance		**10**	Measured Energy Performance	**10**	Measured Energy Performance	15378–3					15378–3			
11	Inspection		**11**	Inspection	**11**	Inspection	15378–1					15378–1			
12	Ways to Express Indoor Comfort		**12**	–	**12**	BMS									
13	External Environment Conditions														
14	Economic Calculation	15459–1													

NOTE The shaded modules are not applicable.

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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 15316-1, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 1: General*

EN 50465, *Gas appliances — Combined heat and power appliance of nominal heat input inferior or equal to 70 kW*

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

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

ISO 3046-1, *Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use*

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