SLOVENSKI STANDARD
kSIST-TP FprCEN/TR 15316-6-7:2016

01-december-2016

[Not translated]

Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-7: Explanation and justification of EN 15316-4-4, Module M8-3-4, M8-8-4, M8-11-4

Heizungsanlagen und Wasserbasierte Kühlanlagen in Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 6-7: Begleitende TR zur EN 15316-4-4 (Wärmeerzeugungssysteme, gebäudeintegrierte KWK -Anlagen)

Ta slovenski standard je istoveten z: **FprCEN/TR 15316-6-7**

ICS:

91.120.10	Toplotna izolacija stavb	Thermal insulation of buildings
91.140.10	Sistemi centralnega ogrevanja	Central heating systems

kSIST-TP FprCEN/TR 15316-6-7:2016 **en**

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TECHNISCHER BERICHT

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Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-7: Explanation and justification of EN 15316-4-4, Module M8-3-4, M8-8-4, M8-11-4

Heizungsanlagen und Wasserbasierte Kühlanlagen in Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 6-7: Begleitende TR zur EN 15316-4-4 (Wärmeerzeugungssysteme, gebäudeintegrierte KWK-Anlagen)

This draft Technical Report is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 228.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (FprCEN/TR 15316-6-7:2016) has been prepared by Technical Committee CEN/TC 228 “Project committee on energy performance in buildings”, the secretariat of which is held by DIN.

This document is currently submitted to the Vote.

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

Introduction

In order to facilitate the necessary overall consistency and coherence, in terminology, approach, input/output relations and formats, for the whole set of EPB-standards, the following documents and tools are available:

a) a document with basic principles to be followed in drafting EPB-standards: CEN/TS 16628:2014, Energy Performance of Buildings - Basic Principles for the set of EPB standards [1];

b) a document with detailed technical rules to be followed in drafting EPB-standards; CEN/TS 16629:2014, Energy Performance of Buildings - Detailed Technical Rules for the set of EPB-standards [2];

c) the detailed technical rules are the basis for the following tools:

   1) a common template for each EPB-standard, including specific drafting instructions for the relevant clauses;

   2) a common template for each technical report that accompanies an EPB standard or a cluster of EPB standards, including specific drafting instructions for the relevant clauses;

   3) a common template for the spreadsheet that accompanies each EPB standard, to demonstrate the correctness of the EPB calculation procedures.

Each EPB-standards follows the basic principles and the detailed technical rules and relates to the overarching EPB-standard, prEN ISO 52000-1:2015.

One of the main purposes of the revision of the EPB-standards is to enable that laws and regulations directly refer to the EPB-standards and make compliance with them compulsory. This requires that the set of EPB-standards consists of a systematic, clear, comprehensive and unambiguous set of energy performance procedures. The number of options provided is kept as low as possible, taking into account national and regional differences in climate, culture and building tradition, policy and legal frameworks (subsidiarity principle). For each option, an informative default option is provided (Annex B).

Rationale behind the EPB technical reports

There is a risk that the purpose and limitations of the EPB standards will be misunderstood, unless the background and context to their contents – and the thinking behind them – is explained in some detail to readers of the standards. Consequently, various types of informative contents are recorded and made available for users to properly understand, apply and nationally or regionally implement the EPB standards.

If this explanation would have been attempted in the standards themselves, the result is likely to be confusing and cumbersome, especially if the standards are implemented or referenced in national or regional building codes.

Therefore each EPB standard is accompanied by an informative technical report, like this one, where all informative content is collected, to ensure a clear separation between normative and informative contents (see CEN/TS 16629 [2]):

- to avoid flooding and confusing the actual normative part with informative content,

- to reduce the page count of the actual standard, and

- to facilitate understanding of the set of EPB standards.

This was also one of the main recommendations from the European CENSE project [5] that laid the foundation for the preparation of the set of EPB standards.

1 Scope

This Technical Report refers to prEN 15316-4-4:2014, *Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-4: Heat generation systems, building-integrated cogeneration systems.*

Building-integrated cogeneration systems are commonly known as micro or small scale cogeneration, or micro or small scale CHP.

It contains information to support the correct understanding, use and national adaptation of prEN 15316-4-4:2014.

This Technical Report does not contain any normative provision.

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.

prEN 15316-4-4:2014, *Heating systems and water based cooling systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-4: Heat generation systems, building-integrated cogeneration systems*

EN 50465, *Gas appliances - Fuel cell gas heating appliances - Fuel cell gas heating appliance of nominal heat input inferior or equal to 70 kW*

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

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

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 7345:1995, prEN ISO 52000-1:2015, prEN 15316-4-4:2014 apply.

4 Symbols and subscripts

4.1 Symbols

For the purposes of this document, the symbols given in prEN ISO 52000-1:2015 and in prEN 15316-4-4:2014 apply.

4.2 Subscripts

For the purposes of this document, subscripts given in prEN ISO 52000-1:2015 and in prEN 15316-4-4:2014 apply.

5 Information on the methods

5.1 General

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

The principle of the assessment of the cogenerator performance is to associate for each heat output (load from 0 %–100 % including the supplementary heat generator if relevant):

- the electricity output;
- the auxiliary power;
- the heat losses.

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

The product data based on testing according to EN 50465 and ISO 3046-1 are used for that calculation.

EN 50465 provides data:

- at 0 % load (standby);
- at CHP 100 % and Sup 0 % (primary heat and power generator only);
- at CHP 100 % and Sup 100 % (primary heat and power generator, and supplementary heat generator).

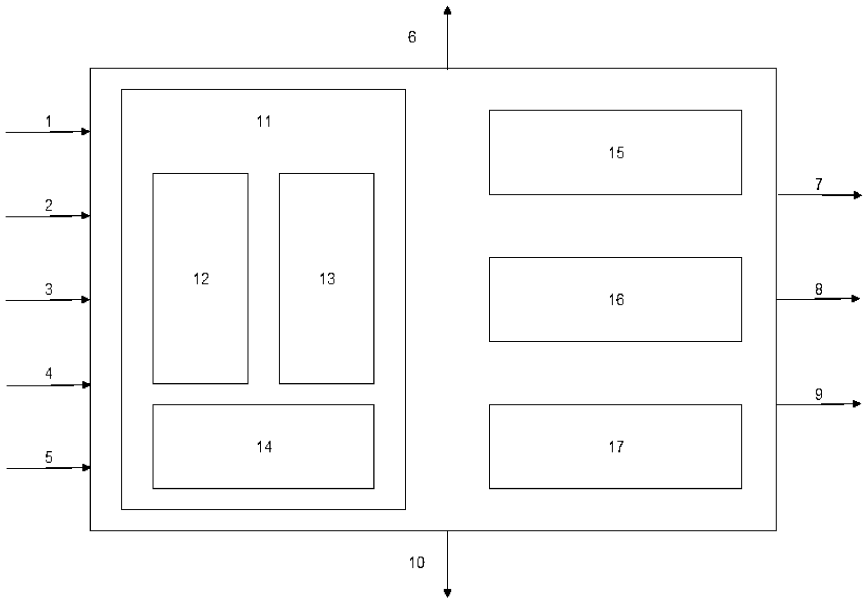
Between these points, linear interpolation is proposed in order to estimate electricity output, auxiliary power, heat losses for each point between 0 % and 100 % loads.

Operating parameters, as the temperature, are influencing the performance of a cogenerator. But as these parameters are not tested according to EN 50465, nor ISO 3046-1, they cannot be taken into account in the performance assessment.

5.2 System boundaries

The cogeneration unit may be of any type, possibly including a supplementary burner and thermal storage, provided it has been tested as a whole to provide the energy performance information needed.

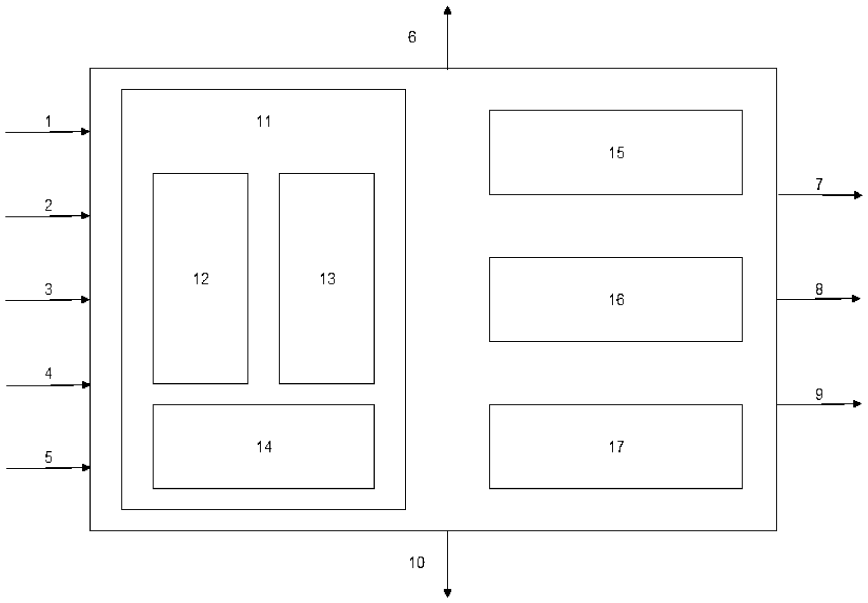
The figures below illustrate typical setups.



Key

1 central Heating Water
2 auxiliary Electricity
3 air
4 gas
5 domestic cold water
6 combustion products
7 central Heating Water
8 electricity
9 domestic hot water
10 condensate
11 primary Heat and Power Generator
12 fuel processing system
13 fuel Cell Module
14 power conditioning and chp-control system
15 supplementary Heat Generator
16 thermal Management
17 support Controls

Figure 1 — Typical set-up for a fuel cell mCHP appliance



Key

1 central Heating Water
2 auxiliary Electricity
3 air
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5 domestic cold water
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7 central Heating Water
8 electricity
9 domestic hot water
10 condensate
11 primary Heat and Power Generator
12 engine Burner
13 stirling Engine Module
14 power conditioning and chp-control system
15 supplementary Heat Generator
16 thermal Management
17 support Controls

Figure 2 — Typical set-up for a Stirling engine mCHP appliance