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English Version

**Energy performance of buildings - Method for calculation
of system energy requirements and system efficiencies -
Part 6-10: Explanation and justification of EN 15316-5,
Module M3-7, M8-7**

Heizungsanlagen und Wasserbasierte Kühlanlagen in
Gebäuden - Verfahren zur Berechnung der
Energieanforderungen und Nutzungsgrade der
Anlagen - Teil 6-10: Begleitende TR zur EN 15316-5
(Wärmeerzeugung für die Raumheizung und
Speichersysteme für Trinkwarmwasser (keine
Kühlung))

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

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European foreword

This document (CEN/TR 15316-6-10:2017) 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.

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Introduction

The set of EPB standards, technical reports and supporting tools

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, EN ISO 52000-1.

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.

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1 Scope

This Technical Report refers to EN 15316-5, covering module M3-7 and M8-7

It contains information to support the correct understanding, use and national adaptation of EN 15316-5.

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 15316-5:2017, *Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies — Part 5: Space heating and DHW storage systems (not cooling), M3-7, M8-7*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 7345:1995, EN ISO 52000-1:2017 and EN 15316-5:2017 apply.

4 Symbols and abbreviations

4.1 Symbols

For the purposes of this document, the symbols given in EN ISO 52000-1:2017 and in EN 15316-5:2017 apply.

4.2 Subscripts

For the purposes of this document, the subscripts given in EN ISO 52000-1:2017, in EN 15316-5:2017 (the accompanied EPB standard) apply.

5 Information on the method

The method calculates the thermal balance of the storage unit. This storage unit is divided, for the calculation purpose, in fixed volumes that are in stable conditions (temperature) for any time step considered.

This method covers the thermal calculation of the storage unit where the temperature is stratified, due to delay between the energy demand and the re-heat by the generation unit.

The generation unit can be located outside of the storage unit (combustion boilers, heat pump) or inside for specific cases (electric resistance for the main or for the back-up).

The temperature of any volume is the result of the energy balance for the volume considered (energy input, mass transfer, thermal losses through the envelope).

In case of multi storage unit the control system defines the priority between the storage unit (parallel mounting) or the order (serial mounting).