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

Part 6-5: Explanation and justification of EN 15316-4-2, Module M3-8

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National foreword

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Performance énergétique des bâtiments - Méthode de calcul des besoins énergétiques et des rendements des systèmes - Partie 6-5: Explication et justification de l'EN 15316-4-2, Module M3-8

Heizungsanlagen und Wasserbasierte Kühlanlagen in Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 6-9: Begleitende TR zur EN 15316-4-2 (Wärmeerzeugung für die Raumheizung, Wärmepumpensysteme)

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European foreword

This document (CEN/TR 15316-6-5:2017) 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* [2];

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* [3];

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 [4].

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 [3]):

— 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 EN 15316-4-2, covering module M3-8.

It contains information to support the correct understanding, use and national adaptation of EN 15316-4-2.

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.

EN 15316-4-2:2017, *Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-2: Space heating generation systems, heat pump systems, Module M3-8-2, M8-8-2*

EN 15603, *Energy performance of buildings — Overall energy use and definition of energy ratings*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 7345, EN 15603, EN 15316-4-2 and the following apply.

3.1
bivalent temperature
$\vartheta_{biv;ref}$
outdoor temperature **declared** by the supplier for heating at which the declared capacity for heating equals the part load for heating and below which the declared capacity for heating requires supplementary capacity for heating to meet the part load for heating, expressed in degrees Celsius

Note 1 to entry: This definition corresponds to the terms of EN 14825.

Note 2 to entry: In the context of EN 15316-4-2, the bivalent temperature ϑ_{biv} is adapted to the thermal load of the building and is different from the EN 14825 conditions which means:

1) Input data consider temperatures, thermal capacities and COP based on the test conditions identified from EN 14825.

2) This EN 14825 bivalent temperature $\vartheta_{biv;ref}$,COP_{ref} and thermal capacity data is used as part of the EN 14825 dataset to interpolate COP and capacity for each time step (operating condition) (using Path B)

3) EN 15316-4-2 determines a specific bivalent temperature for each time step (operating condition), which is different to the Manufacturer declared value (from EN 14825 data), to determine back-up requirement

4) Practically the bivalent temperature is a fixed value declared in the input data ϑ_{biv} and use for control of the additional heating system when thermal capacity does not fulfill the thermal capacity required.