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Gasfyrede centralvarmekedler – Del 2-3: Særlig standard for hybridt rumopvarmningsudstyr, der kombinerer et gasfyret apparat og varmepumpe i et produkt

Gas-fired central heating boilers – Part 2-3: Specific standard for hybrid units combining a gas-fired boiler and an electrical heat pump in a product

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English Version

Gas-fired central heating boilers - Part 2-3: Specific standard for hybrid units combining a gas-fired boiler and an electrical heat pump in a product

Chaudières de chauffage central utilisant les combustibles gazeux - Partie 2-3 : Norme spécifique pour les appareils de chauffage hybrides combinant appareil à combustible gazeux et pompe à chaleur dans un même produit

Heizkessel für gasförmige Brennstoffe - Teil 2-3: Spezifische Norm für Hybrid-Raumheizgeräte, die gasbefeuerte Geräte mit Wärmepumpen in einem Produkt kombinieren

This European Standard was approved by CEN on 26 June 2023.

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European foreword

This document (EN 15502-2-3:2023) has been prepared by Technical Committee CEN/TC 109 “Central heating boilers using gaseous fuels”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by March 2024, and conflicting national standards shall be withdrawn at the latest by March 2024.

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.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annexes ZB, ZC, ZD and ZE, which are an integral part of this document.

Relation between this document and EN 15502-2-1:2022 and EN 15502-1:2021:

a) This document is intended to be used in conjunction with EN 15502-2-1:2022, while EN 15502-2-1:2022 is intended to be used in conjunction with EN 15502-1:2021. This means that this document is intended to be used in conjunction with both EN 15502-2-1:2022 and EN 15502-1:2021 and that all information in EN 15502-2-1:2022 and EN 15502-1:2021 applies as well, unless stated otherwise (see under b) and c)).

b) This document follows the numbering structure of EN 15502-2-1:2022 and expands on it, while EN 15502-2-1:2022 follows the numbering structure of EN 15502-1:2021 and expands on it.

c) Where this document states: “Shall be according to EN 15502-2-1:2022, [clause number]”, the numbering, title and text of that clause of EN 15502-2-1:2022 is intended to be used. This is including its subclauses and subclause numbering, tables and table numbering, equations and equation numbering, figures and figure numbering, lists and list numbering.

   NOTE This document and its annexes can refer to (sub)clause numbers that are to be found either in this document, in EN 15502-2-1:2022 or in EN 15502-1:2021.

d) This document refers to clauses of EN 15502-2-1:2022 or adapts its clauses by stating in the corresponding clause:

   — “shall be according to EN 15502-2-1:2022, [clause number] with the following modification”;

   — “shall be according to EN 15502-2-1:2022, [clause number] with the following modification of [sub clause number(s)]”;

   — “shall be according to EN 15502-2-1:2022, [clause number] with the following addition”;

   — “shall be according to EN 15502-2-1:2022, [clause number] with the addition of [subclause number(s)] at the end”;

   — “EN 15502-2-1:2022, [clause number] is replaced by the following”;

   — “the title of EN 15502-2-1:2022 [clause number] is replaced by the following”;

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— "EN 15502-2-1:2022, [clause number] is not applicable".

e) Clauses or subclauses in this document that are additional to the structure of EN 15502-2-1:2022 are numbered "20x" (e.g. 3.1.201, 8.4.201, Table 201, Formula 201, Figure 201) or designated as Annex "Y" (e.g Annex YA, YB, YC, etc.). These additional (sub)clauses provide requirements and information that is specific for the appliances that are covered in the scope of this document.

NOTE The additional (sub)clauses in this docuement are not indicated as an addition to EN 15502-2-1:2022.

The following standards can be applicable to the product(s) identified in the scope:

a) the electrical heat pump, EN 14511-4:2018, EN 378-1:2016+A1:2020, EN 378-2:2016 and EN 14825:2022;

b) electrical safety, EN 60335-1:2012[1], EN 60335-2-102:2016 and EN IEC 60335-2-40:2023[2];

c) for domestic hot water production, EN 13203-5:2022.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

[1] As impacted by EN 60335-1:2012/AC:2014, EN 60335-1:2012/A11:2014, EN 60335-1:2012/A1:2019, EN 60335-1:2012/A2:2019, EN 60335-1:2012/A13:2017, EN 60335-1:2012/A14:2019 and EN 60335-1:2012/A15:2021.

[2] As impacted by EN IEC 60335 2 40:2023/A11:2023.

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Introduction

Hybrid heat pump using gas as fossil energy (called “hybrid unit” in this document) is intended to combine renewable source heat generators and gas-fired heat generators. Most of these renewable sources have a climate dependent efficiency and capacity, such as air-to-water heat pumps relying on the inlet air conditions. Therefore, the seasonal efficiency of hybrid units cannot be assessed in the same way as the seasonal efficiency of gas-fired heaters, where the climate effect on efficiency is not noticeable.

A hybrid unit using gas as fossil energy cannot be considered as a heat pump nor fully as a gas-fired appliance.

The standard rating conditions and methods are given in the EN 15502-1:2021 and EN 15502-2-1:2022 for gas-fired appliances and EN 14511-2:2018 and EN 14511-3:2018 for heat pumps.

This document deals with safety aspects especially coming from coexistence of gas and refrigerant fluid.

This document provides a method to define the seasonal efficiency of hybrid units. The method is based on a set of part load conditions in different climatic conditions weighted to represent the space heating demand over a year.

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1 Scope

This document specifies the requirements and tests methods concerning the construction, safety, fitness for purpose, and rational use of energy, as well as the classification and marking of hybrid units.

A hybrid unit is composed of:

— a gas boiler as a heat generator which is able to supply the heat demand in all operating conditions;

— an electrical air-to-water heat pump, as a heat generator, which does not have to meet the heat demand in all operating conditions;

— a control unit (see definition in 3.1.10).

A hybrid unit can include the facility to produce hot water, either by the instantaneous or storage principle, the whole being marketed as a single unit.

A gas boiler as part of a hybrid unit covered by this document is a gas-fired central heating boiler from the types C_1 up to C_9 and the types B_2, B_3 and B_5, according to the classification in EN 1749:2020:

a) that have a nominal heat input (on the basis of gross calorific value) not exceeding 400 kW;

b) that use one or more combustible gases of the three gas families at the pressures stated in EN 437:2021;

c) where the temperature of the heat transfer fluid does not exceed 105 °C during normal operation;

d) where the maximum operating pressure in the water circuit does not exceed 6 bar;

e) which are classified as a gas-fired central heating boiler;

f) which are intended to be installed either indoors or outdoors in a partially protected place;

g) which are designed for either sealed water systems or for open water systems.

This document provides requirements for boilers with known constructions.

NOTE 1 For boilers with any alternative constructions, which might not fully be covered by this document, the risk associated with this alternative construction needs to be assessed.

NOTE 2 An example of an assessment methodology, based upon risk assessment and which covers the essential requirements of the Gas Appliance Regulation UE/426/2016, is given in Clause 11.

This document does not cover all the requirements for:

aa) appliances that are intended to be connected to gas grids where the quality of the distributed gas is likely to vary to a large extent over the lifetime of the appliance (see EN 15502-1:2021, Annex AB);

ab) appliances using flue dampers;

ac) appliances of the types B_{21}, B_{31}, B_{51}, C_{21}, C_{41}, C_{51}, C_{61}, C_{71} and C_{81};

ad) appliances incorporating flexible plastic flue liners;

ae) appliances designed to become connected to a combined flue duct system.

af) appliances of the types $C_{(10)}$,$C_{(11)}$, $C_{(12)}$ and $C_{(13)}$;

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ag) C7 appliances that have a nominal heat input (on the basis of net calorific value) exceeding 70 kW;

ah) appliances intended to be connected to a flue having mechanical extraction;

ai) surface temperatures of external parts particular to children and elderly people;

aj) appliances that are intended to burn natural gases of the second family where hydrogen is added to the natural gas;

ak) appliances equipped with an adaptive combustion control function (ACCF);

al) boilers intended to be installed in areas accessible to elderly people and children.

This document specifies minimum operating requirements which ensure that the products are fit for the use designated by the technical instructions when used for space heating and/or DHW production.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 378-1:2016+A1:2020, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria*

EN 378-2:2016, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation*

EN 14511-1:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 1: Terms and definitions*

EN 14511-3:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 3: Test methods*

EN 14511-4:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 4: Requirements*

EN 14825:2022, *Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance*

EN 15502-1:2021, *Gas-fired heating boilers - Part 1: General requirements and tests*

EN 15502-2-1:2022, *Gas-fired central heating boilers - Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW*

EN 15502-2-2:—[3], *Gas-fired central heating boilers — Part 2-2: Specific standard for type B1 appliances*

EN IEC 60335-2-40:2023[2], *Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers*

[3] To be published. Stage at the time of publication: prEN 15502-2-2:2023.

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ISO 817:2014[4], *Refrigerants — Designation and safety classification*

[4] As impacted by ISO 817:2014/A1:2017 and ISO 817:2014/A2:2021.