SLOVENSKI STANDARD
SIST-TS CEN/TS 15502-3-3:2026

01-julij-2026

Plinski kotli za centralno ogrevanje - 3-3. del: 100-odstotni vodik - Razširitev standarda EN 15502-2-1:2022

Gas-fired central heating boilers - Part 3-3: 100 % Hydrogen - Expansion of EN 15502-2-1:2022

Heizkessel für gasförmige Brennstoffe - Teil 3-3: 100% Wasserstoff - Erweiterung der EN 15502-2-1:2022

Ta slovenski standard je istoveten z: **CEN/TS 15502-3-3:2026**

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91.140.10	Sistemi centralnega ogrevanja	Central heating systems
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TECHNICAL SPECIFICATION

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Gas-fired central heating boilers - Part 3-3: 100 % Hydrogen - Expansion of EN 15502-2-1:2022

Heizkessel für gasförmige Brennstoffe - Teil 3-3: 100% Wasserstoff - Erweiterung der EN 15502-2-1:2022

This Technical Specification (CEN/TS) was approved by CEN on 6 April 2026 for provisional application.

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European foreword

This document (CEN/TS 15502-3-3:2026) has been prepared by Technical Committee CEN/TC 109 “Central heating boilers using gaseous fuels”, the secretariat of which is held by DIN.

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 contains an expansion of the scope of EN 15502-2-1:2022+A1:2023 and provides requirements needed for this expansion.

EN 15502 consists of the following parts under the general title “Gas-fired heating boilers":

— *Part 1: General requirements and tests;*

— *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;*

— *Part 2-2: Specific standard for type B1 appliances;*

— *Part 2-3: Specific standard for hybrid units combining a gas-fired boiler and an electrical heat pump in a product;*

— *Part 3-1: H2NG and ACCF — Expansion of EN 15502-2-1:2022;*

— *Part 3-2: H2NG — Expansion of prEN 15502-2-2:202x* (under development);

— *Part 3-3: Hydrogen — Expansion of EN 15502-2-1:2022.*

Relationship between this document, EN 15502-2-1:2022+A1:2023 and EN 15502-1:2021+A1:2023 - the reader needs to be aware of the following information:

a) this document (CEN/TS 15502-3-3) is to be used in conjunction with EN 15502-2-1:2022+A1:2023, while EN 15502-2-1:2022+A1:2023 is to be used in conjunction with EN 15502-1:2021+A1:2023. This means that this TS is to be used in conjunction with both EN 15502-2-1:2022+A1:2023 and EN 15502-1:2021+A1:2023 and that all information in EN 15502-2-1:2022+A1:2023 and EN 15502-1:2021+A1:2023 applies as well, unless stated otherwise (see under b)).

NOTE 1 To find the actual requirements or information in the (sub)clauses of EN 15502-2-1:2022+A1:2023 referred to in this TS, one might need to check EN 15502-1:2021+A1:2023 (as EN 15502-2-1:2022+A1:2023 is to be used in conjunction with EN 15502-1:2021+A1:2023).

b) the numbering structure of this TS is using the numbering structure of EN 15502-2-1:2022+A1:2023 and expanding on it. Where this TS states: Shall be according to EN 15502-2-1:2022+A1:2023, [clause number], the numbering, title and text of that clause of EN 15502-2-1:2022+A1:2023 is to be used (incl. sub clauses and sub clause numbering, tables and table numbering, equations and equation numbering, figures and figure numbering, lists and list numbering).

NOTE 2 The TS and its annexes can refer to (sub)clause numbers that are to be found either in this TS, or EN 15502-2-1:2022+A1:2023, or EN 15502-1:2021+A1:2023.

c) The relevant text of EN 15502-2-1:2022+A1:2023 is to be adapted accordingly in all cases where this TS states:

— shall be according to EN 15502-2-1:2022+A1:2023, [clause number] with the following modification;

— shall be according to EN 15502-2-1:2022+A1:2023, [clause number] with the following modification of [sub clause number(s)];

— shall be according to EN 15502-2-1:2022+A1:2023, [clause number] with the following addition;

— shall be according to EN 15502-2-1:2022+A1:2023, [clause number] with the addition of [sub clause number(s)] at the end;

— EN 15502-2-1:2022+A1:2023, [clause number] is replaced by the following;

— the title of EN 15502-2-1:2022+A1:2023 [clause number] is replaced by the following;

— EN 15502-2-1:2022+A1:2023, [clause number] is not applicable.

d) Clauses or subclauses in this TS that are additional to the structure of EN 15502-2-1:2022+A1:2023 are numbered “30x” (e.g. 3.1.301, 8.4.301, Table 301, Equation (301), Figure 301) or designated as Annex “HY” (e.g. Annex HYA, HYB, HYC, etc.). These additional (sub)clauses provide requirements and information that is specific for the appliances that are covered in the scope of this TS.

NOTE 3 The additional (sub)clauses in this TS are not indicated as an addition to EN 15502-2-1:2022+A1:2023.

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 announce this Technical Specification: 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.

Introduction

The introduction of EN 15502-2-1:2022+A1:2023 applies.

1 Scope

Shall be according to EN 15502-2-1:2022+A1:2023, Clause 1 with the following modifications:

Replace:

“This document covers gas-fired central heating boilers from the types C_1 up to $C_{(11)}$ and the types B_2, B_3 and B_5:”

By:

“This document covers gas-fired central heating boilers from the types C_1, C_3 up to C_9 and the types B_2, B_3 and B_5 :”

b) is replaced by:

“b) that use combustible gases of gas group 4Y at the nominal pressure of 20 mbar;

Appliance category	P_n	P_{min}	P_{max}
4th family	20	17	25

“

k) is not applicable.

Add at the end of the list, after k), the following:

l) which are fully premixed appliances equipped with a Pneumatic Gas/Air Ratio controller (PGAR) or an Adaptive Combustion Control Function (ACCF) that are intended to be connected to hydrogen gas grids where the quality of the distributed hydrogen gas is likely expected to stay within a Wobbe index range of 42 to 46 MJ/m³.

Replace in the list following

“This document does not cover all the requirements for:”

ab), ag), ah) and al) by:

ab) appliances that are intended to be connected to gas grids where the quality of the distributed hydrogen gas is likely to vary outside the Wobbe index range of 42 to 46 MJ/m³;

ag) $C_{(10)}$ boilers;

ah) $C_{(11)}$ boilers;

al) partially premixed appliances equipped with an adaptive combustion control function (ACCF);

and add an) and ao);

an) the conversion from natural gas to hydrogen;

ao) the risk of aeration of the gas supply to the appliance.

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.

The normative references of EN 15502-2-1:2022+A1:2023 apply with the following additions:

EN 88-1:2022+A1:2023, *Safety and control devices for gas burners and gas burning appliances — Part 3: Pressure and/or flow rate regulators for inlet pressures up to and including 500 kPa, electronic types*

EN 88-3:2022+A1:2024, *Safety and control devices for gas burners and gas burning appliances — Part 3: Pressure and/or flow rate regulators for inlet pressures up to and including 500 kPa, electronic types*

EN 15502-2-1:2022+A1:2023, *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 12067-2:2022, *Safety and control devices for burners and appliances burning gaseous or liquid fuels — Control functions in electronic systems — Part 2: Fuel/air ratio control/supervision of the electronic type*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15502-2-1:2022+A1:2023 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1.301 Definitions introduced in this TS

3.1.301.1
H_2 grid
grid intended to supply gas to H_2 appliances

3.1.301.2
H_2 appliances

appliances that are intended to burn fourth family gases containing mainly hydrogen

3.1.301.3
gas group 4Y
gas group for hydrogen appliances for gases containing > 98 % hydrogen and Wobbe index range (W_s) of 42 to 46 MJ/m³

Note 1 to entry: Category I_{4Y}: appliances are using only gases of group Y of the fourth family at the prescribed supply pressure.

Note 2 to entry: Category $II_{2E\,4Y}$: appliances are capable of using gases of group E of the second family and gases of the fourth family. The second family gases are used under the same conditions as for category I_{2E}. The fourth family gases are used under the same conditions as for category I_{4Y}.

Note 3 to entry: Other category II and III appliances are possible (e.g. Category $III_{2H\,3B/P\,4Y}$).

3.1.301.4
reduced nominal heat input
Q_{rn}
nominal heat input obtained with the boiler set using the high Wobbe index reference gas at reference conditions and operated using the low Wobbe index reference gas at reference conditions

Note 1 to entry: This is only used for expressing the reduction on the heat input due to the variation of the gas composition supplied by (rededicated) H_2 gas grids.

3.1.301.5
reduced nominal heat output
P_{rn}
nominal heat output obtained with the boiler set using the high Wobbe index reference gas at reference conditions and operated using the low Wobbe index reference gas at reference conditions

Note 1 to entry: This is only used for expressing the reduction on the heat output due to the variation of the gas composition supplied by (rededicated) H_2 gas grids.

3.1.301.6
distributed gas
gaseous fuel used on the territory of the CEN members and affiliated members

Note 1 to entry: Corresponds to the one given in the Regulation (EU) 2016/426 on gas appliances (article 2.2).

[SOURCE: EN 437:2021, 3.2, modified]

3.1.301.7
Distribution Limit Gas
DLG
distribution gases that will most likely result in an undesired combustion phenomenon

Note 1 to entry: The DLG depends on the distributed gas and the combustion and mixing technology used in the appliance and the undesired combustion phenomenon.

Note 2 to entry: The DLG is specifying the normal operating range of gases for which the appliance is suitable for, as declared in the instructions for installation.

3.1.301.8
test gas
gas intended for the verification of the operational characteristics of gas appliances

Note 1 to entry: Test gases include reference gases and limit gases.

[SOURCE: EN 437:2021, 3.3]

3.1.301.9
reference gas
test gas with which appliances operate under nominal conditions when they are supplied at the corresponding normal pressure

[SOURCE: EN 437:2021, 3.4]

Note 1 to entry: In this TS a new appliance category is used that have two reference gases, as this TS covers appliances that are intended to be connected to H_2 gas grids.

Note 2 to entry: Where in this TS reference gas is mentioned without specifying high or low Wobbe index, always the high Wobbe index reference gas is intended.

3.1.301.10
low Wobbe index reference gas
reference gas containing the minimum amount of hydrogen with which appliances operate under nominal low Wobbe index conditions when they are supplied at the corresponding normal pressure

Note 1 to entry: As an example, for a 4Y appliance with the reference gas G40, the low Wobbe index reference gas is G40.1 with 98,74 % of hydrogen and 1,26 % of nitrogen. See Table HYF.2 in Annex HYF.

3.1.301.11
high Wobbe index reference gas
reference gas containing the maximum amount of hydrogen with which appliances operate under nominal high Wobbe index conditions when they are supplied at the corresponding normal pressure

Note 1 to entry: As an example, for a 4Y appliance with reference gas G40, the high Wobbe index reference gas is G40. See Table HYF.2 in Annex HYF.

3.1.301.12
limit gas
test gas representative of the extreme variations in the characteristics of the gases for which appliances have been designed

[SOURCE: EN 437:2021, 3.5]

Note 1 to entry: A limit gas that is intended to be used as a test gas where the test conditions, other than the test pressures, are not required to be at the extremes of the normal operating conditions of the appliance, is referred to in this document as Extreme Limit Gas (ELG).

Note 2 to entry: A limit gas that is intended to be used as a test gas where the test conditions, including the test pressures, are required to be at the extremes of the normal operating conditions of the appliance, is referred to in this document as Distribution Limit Gas (DLG, see 3.1.301.7).

Note 3 to entry: Clause HYC.2 explains why the limit gases indicated in EN 437 are not suitable for ACCF appliances.

3.1.301.13
test pressure

gas pressure used to verify the operational characteristics of gas appliances, consisting of normal and limit pressures

Note 1 to entry: Gas pressure is expressed in millibars (mbar) 1 mbar = 100 Pa.

[SOURCE: EN 437:2021, 3.6]

3.1.301.14
normal pressure
p_n
pressure under which the appliances operate in nominal conditions when they are supplied with the corresponding reference gas

[SOURCE: EN 437:2021, 3.7]

3.1.301.15
limit pressure
p_{max}, p_{min}
pressures representative of the extreme variations in the appliance supply conditions

Note1 to entry: Limit pressures comprise a maximum pressure p_{max} and a minimum pressure p_{min}.

[SOURCE: EN 437:2021, 3.8]

3.1.301.16
manual calibration of an ACCF appliance
calibration of an ACCF appliance that is started by the installer

Note 1 to entry: The instruction for installation may indicate instructions for performing a manual calibration. These instructions may specify that the manual calibration shall only be performed while burning a gas of known composition, or that a verification of combustion parameters after manual calibration shall be performed.

3.1.301.17
λ adjustment of a PGAR appliance
calibration and adjustment of the air factor λ of a PGAR appliance that is performed in the field by the installer, according to the instructions for installation

Note 1 to entry: A calibration and adjustment can be initiated to detect, and if necessary compensate, for drift and ageing etc and/or change in gas quality.

Note 2 to entry: In practice the λ adjustment for H_2 appliances is based on the measured O_2 concentration in the flue (see 12.2.1.2).

Note 3 to entry: The instruction for installation may indicate that the λ adjustment shall only be performed while burning a gas of known composition (see 12.2.1.2).

Note 4 to entry: A λ adjustment is also indicated as “throttle" adjustment in the EN 15502 series.

3.1.301.18
Δ*P* adjustment of a PGAR appliance
calibration and adjustment of the pressure difference between the gas and air of a PGAR appliance, that is performed in the field by the installer, according to the instructions for installation

Note 1 to entry: A calibration and adjustment can be initiated to detect, and if necessary compensate, for drift and ageing of the pressure regulating function of the PGAR.

Note 2 to entry: A Δ*P* adjustment is also indicated as “offset" adjustment in the EN 15502 series.

3.1.301.19
self-calibration of an ACCF appliance
automatically started calibration of an ACCF appliance

Note 1 to entry: A calibration can be initiated to detect and if necessary compensate for drift and ageing etc and change in gas quality.

3.1.301.20
Pneumatic Gas Supply control
PGS
device where the gas supply rate is pneumatically driven by the external gas supply pressure or an internal appliance pressure regulator

Note 1 to entry: Pneumatically driven means that the product of the density and square of the volume rate of the gas is proportional to the pressure difference. This is according to the Bernoulli principle.

Note 2 to entry: The most common PGS controls consist of a nozzle or injector having a turbulent flow.

Note 3 to entry: The Wobbe index, as a key gas quality parameter, was defined having pneumatically driven gas supply in mind, as this was the only technology used in the past.

Note 4 to entry: An appliance with an injector burner or an atmospheric appliance is called a PGS appliance.

3.1.301.21
Pneumatic Gas/Air Ratio control
PGAR
device where the gas supply rate is pneumatically driven by the air supply rate or vice versa

Note 1 to entry: Pneumatically driven means that the product of the density and the square of the volume rate of the gas is proportional to the product of the density and the square of the volume rate of the air. This is according to the Bernoulli principle.

Note 2 to entry: The most common PGAR controls consist of a nozzle with a turbulent flow for the gas rate where the pressure difference over this nozzle is driven by a pressure difference resulting from a restriction in the combustion air flow having a turbulent flow.

Note 3 to entry: PGAR systems can be driven either mechanically or electronically.

3.1.301.22
Adaptive Combustion Control Function
ACCF
control function, intended to maintain λ in a range Δλ relative to the nominal λ by adapting the flow of gaseous fuel and/or the flow of air and/or other physical quantities to compensate changes in input parameters relevant for the combustion process

Note 1 to entry: Changes in input parameters could be for example the composition of the fuel or the combustion air temperature.

Note 2 to entry: Source: EN 12067-2:2022, 3.117.

3.1.301.23
permanent safe state
permanent safe state is a non-volatile lock-out of the appliance, that cannot be reset by the end customer, but can be reset by a (qualified) installer

3.1.301.24
nominal λ
declared λ that is used as a target for the ACCF

Note 1 to entry: The declared λ may depend on operating parameters such as heat input.

3.2 Symbols

Shall be according to EN 15502-2-1:2022+A1:2023, 3.2 with the following addition at the end:

Table 301 — Additional symbols and abbreviations used

Definition	Symbol / abbreviation
Reduced nominal heat input [kW]	Q_{rn}
Reduced nominal heat output [kW]	P_{rn}
Air factor	λ