SLOVENSKI STANDARD
oSIST prEN 13203-4:2018

01-december-2018

Plinske gospodinjske naprave za pripravo tople sanitarne vode - 4. del: Ocenjevanje količine energije za soproizvodnjo tople vode in elektrike (mCHP)

Gas-fired domestic appliances producing hot water - Part 4: Assessment of energy consumption of gas combined heat and power appliances (mCHP) producing hot water and electricity

Gasbeheizte Geräte für die sanitäre Warmwasserbereitung für den Hausgebrauch - Teil 4: Bewertung des Energieverbrauchs von Gasgeräten mit Kraft-Wärme-Kopplung (Mikro-KWK) zur Warmwasserbereitung und Stromerzeugung

Appareils domestiques produisant de l'eau chaude sanitaire utilisant les combustibles gazeux - Partie 4 : Evaluation de la consommation énergétique des appareils à gaz de production combinée de chaleur et d'électricité (mCHP) produisant de l'eau chaude et de l'électricité

Ta slovenski standard je istoveten z: **prEN 13203-4**

ICS:

91.140.65	Oprema za ogrevanje vode	Water heating equipment

oSIST prEN 13203-4:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13203-4

November 2018

ICS 91.140.65

Will supersede EN 13203-4:2016

English Version

Gas-fired domestic appliances producing hot water - Part 4: Assessment of energy consumption of gas combined heat and power appliances (mCHP) producing hot water and electricity

Appareils domestiques produisant de l'eau chaude sanitaire utilisant les combustibles gazeux - Partie 4 : Evaluation de la consommation énergétique des appareils à gaz de production combinée de chaleur et d'électricité (mCHP) produisant de l'eau chaude et de l'électricité

Gasbeheizte Geräte für die sanitäre Warmwasserbereitung für den Hausgebrauch - Teil 4: Bewertung des Energieverbrauchs von Gasgeräten mit Kraft-Wärme-Kopplung (Mikro-KWK) zur Warmwasserbereitung und Stromerzeugung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 109.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (prEN 13203-4:2018) has been prepared by Technical Committee CEN/TC 109 “Central heating boilers using gaseous fuels”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, ZB, ZC or ZD, which are an integral part of this document.

The safety operation of the boiler is not covered by this standard. Safety is proved by means of the essential safety requirements of the Gas Appliances Directive 2009/142/EC or GAR n°426/2016. This way be achieved by compliance with the appropriate existing harmonized standards.

NOTE Useful standards are EN 26, EN 89, EN 15502–1, EN 15502–2–1, EN 15502–2–2 and EN 50465:2015.

Introduction

This European Standard refers to clauses of FprEN 13203-2:2018 or adapts clauses by stating in the corresponding clause, on the principle:

— shall be according to FprEN 13203-2:2018, (clause number) with the following modification;

— shall be according to FprEN 13203-2:2018, (clause number) with the following addition;

— FprEN 13203-2:2018, (clause number) shall be replaced with the following;

— FprEN 13203-2:2018, (clause number) is not applicable.

1 Scope

This document is applicable to gas-fired mCHP appliances producing domestic hot water and electricity. The electricity is generated in a process linked to the production of useful heat.

It applies to a mCHP appliances marketed as single unit or as a package fully specified by a manufacturer that have:

— a gas heat input not exceeding 400 kW,

— an electrical output not exceeding 50 kW, and

— a hot water storage capacity (if any) not exceeding 2 000 l.

EN 13203-1:2015 sets out in qualitative and quantitative terms the performance in delivery of domestic hot water for a variety of uses. It also gives a system for presenting the information to the user.

The present document sets out a method for assessing the energy performance of gas fired mCHP appliances. It defines a number of daily tapping cycles for each domestic hot water use, kitchen, shower, bath and a combination of these, together with corresponding test procedures, enabling the energy performances of different gas-fired appliances to be compared and matched to the needs of the user.

When the mCHP generator does not supply domestic hot water in the summer period, the present standard is not applicable. FprEN 13203-2:2018 is used for performance assessment of these generators.

2 Normative references

FprEN 13203-2:2018, *Clause 2* shall be replaced with the following:

"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.

FprEN 13203-2:2018, *Gas-fired domestic appliances producing hot water – Part 2: Assessment of energy consumption*".

3 Terms and definitions

Shall be according to FprEN 13203-2:2018, Clause 3, with the following additions:

3.18
mCHP appliance
appliance which is placed on the market either as a complete package or specified as a complete package to deliver safely and effectively the heating, electrical power and the domestic hot water service claimed, comprising as relevant:

— primary heat and power generator;

— supplementary heat generator;

— flue ducts;

— thermal store

3.19
mCHP generator
preferential heat and power generator

3.20
supplementary heat generator
non-preferential heat source providing peak load

3.21
power conditioning and control system
equipment used to change electrical voltage level and waveform, or otherwise alter or regulate the electrical output of the primary heat and power generator to make it suitable and safe for export to other components within or outside the appliance including controls used to operate the primary heat and power generator such a gas valve, safety controls and internal cooling pumps

3.22
electric auxiliary energy ($E_{Auxiliary}$)
electric energy consumed by the mCHP appliance components associated with the supplementary heat generator, thermal management and controls (e.g. pump, fan, valves, control unit)

Note 1 to entry: $E_{Auxiliary}$ is expressed in kWh.

3.23
produced electrical energy (E_{CHP})
electrical energy produced by the mCHP generator

Note 1 to entry: E_{CHP} is expressed in kWh.

3.24
delivered electrical energy ($E_{delivered}$)
electrical energy delivered by the mCHP appliance to the grid

Note 1 to entry: $E_{delivered}$ is expressed in kWh.

4 General test conditions

4.1 Reference conditions

Shall be according to FprEN 13203-2:2018, 4.1 with the following addition:

After the last indent "— electrical supply voltage:" *add* "— (410 ± 4) V three phase.".

4.2 Measurement uncertainties

4.2.1 General

Shall be according to FprEN 13203-2:2018, 4.2.1.

4.2.2 Steady state conditions

Shall be according to FprEN 13203-2:2018, 4.2.2.

4.3 Test conditions

4.3.1 General

Shall be according to FprEN 13203-2:2018, 4.3.1 except the second sentence not applicable.

4.3.2 Test room

Shall be according to FprEN 13203-2:2018, 4.3.2.

4.3.3 Water supply

Shall be according to FprEN 13203-2:2018, 4.3.3.

4.3.4 Initial adjustment of the appliance

Shall be according to FprEN 13203-2:2018, 4.3.4.

4.3.5 Conditions for the determination of the maximum load profile

Shall be according to FprEN 13203-2:2018, 4.3.5.

4.3.6 Electrical supply

Shall be according to FprEN 13203-2:2018, 4.3.6.

The following subclause 4.3.7 shall be added: "

4.3.7 Delivered electrical energy

Arrangement shall be made to enable the delivered electrical energy to be measured.

NOTE The delivered electrical energy to be measured may be dissipated by a resistor or exported to the grid.".

5 Determination of the energy consumption and electrical energy generation of the appliance

5.1 General

Shall be according to FprEN 13203-2:2018, 5.1.

5.2 Load profiles

Shall be according to FprEN 13203-2:2018, 5.2.

5.3 Determination of the energy recovered by the useful water

Shall be according to FprEN 13203-2:2018, 5.3.

5.4 Calculation of gas energy

5.4.1 Calculation of the daily gas energy consumption in summer mode

Shall be according to FprEN 13203-2:2018, 5.4.1.

5.4.2 Calculation of daily gas energy consumption in winter mode

Shall be according to FprEN 13203-2:2018, 5.4.2 with the following modifications:

Formula (5) shall be replaced with the following: "

$$Q_{gas,W} = \frac{Q_{gas,S}}{1 + 0,5 \cdot \left[\frac{\eta_{CHP,Th-100} \cdot Q_{gas,S}}{Q_{ref}} - 1 \right]} \quad (5)".$$

Into the key, "η_{CH-nom}" *shall be replaced with* " $\eta_{CHP,Th-100}$" *as follows:*

"$\eta_{CHP,Th-100}$ is the useful thermal efficiency at nominal heat input of the mCHP generator (100 % by mCHP and 100 % by the supplementary heater) at the temperature regime specified in the product standard EN 50465:2015+A1:2018 for the appliance space heating function or at the maximum declared average temperature. The useful thermal efficiency at nominal heat input will be determined including hydraulic circuit and storage tank if applicable. See the Figures D.1 and D.2.".

The last 4th paragraphs shall be replaced with the following:

"The heat engine for a combination mCHP appliance in winter mode spends most of the demand time on space heating, outside any night (or day) set-back periods (which require a lower room temperature and hence heating load).

When a combination mCHP appliance switches from space heating to domestic hot water mode and back to space heating the standby losses usually generated from the domestic hot water mode are not lost but are instead used in the space heating mode.

That means combination heaters have lower domestic hot water heat losses in winter mode than in summer mode.

These energy savings benefits of combination mCHP appliances have to be taken in account.".

5.4.3 Daily gas energy consumption seasonally weighted

Shall be according to FprEN 13203-2:2018, 5.4.3.

5.5 Calculation of the daily electrical energy

FprEN 13203-2:2018, 5.5 is replaced by the following: "

5.5.1 Calculation of the delivered electrical energy

5.5.1.1 General

The delivered electrical energy from the appliance in the summer mode ($E_{delivered,24}$, in kWh) shall be measured during the tapping cycle test as described in 5.2 and according to the instructions (see also Figure 1 showing the test point). It starts at the same time and finishes at the same time as the measurement of the gas consumption.