SLOVENSKI STANDARD
oSIST prEN 13203-6:2021

01-februar-2021

Plinske gospodinjske naprave za pripravo tople sanitarne vode - 6. del: Ocenjevanje rabe energije adsorpcijskih in absorpcijskih toplotnih črpalk

Gas-fired domestic appliances producing hot water - Part 6: Assessment of energy consumption of adsorption and absorption heat pumps

Gasbeheizte Geräte für die sanitäre Warmwasserbereitung für den Hausgebrauch - Teil 6: Bewertung des Energieverbrauchs von gasbeheizten Sorptionswärmepumpen

Appareils domestiques produisant de l'eau chaude sanitaire utilisant les combustibles gazeux - Partie 6 : Évaluation de la consommation énergétique des pompes à chaleur à ad-sorption et ab-sorption

Ta slovenski standard je istoveten z: **prEN 13203-6**

ICS:

27.080	Toplotne črpalke	Heat pumps
91.140.65	Oprema za ogrevanje vode	Water heating equipment

oSIST prEN 13203-6:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT prEN 13203-6

February 2021

ICS 91.140.65

Will supersede EN 13203-6:2018

English Version

Gas-fired domestic appliances producing hot water - Part 6: Assessment of energy consumption of adsorption and absorption heat pumps

Appareils domestiques produisant de l¿eau chaude sanitaire utilisant les combustibles gazeux - Partie 6 : Évaluation de la consommation énergétique des pompes à chaleur à ad-sorption et ab-sorption

Gasbeheizte Geräte für die sanitäre Warmwasserbereitung für den Hausgebrauch - Teil 6: Bewertung des Energieverbrauchs von gasbeheizten Sorptionswärmepumpen

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, 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, 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

Ref. No. prEN 13203-6:2021 E

Contents

Page

European Foreword

This document (prEN 13203-6:2021) 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 will supersede EN 13203-6:2018.

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, B, C or D, which is an integral part of this document.

The main purpose of this revision is to provide a means of conforming to requirements of Commission Delegated Regulation (EC) n° 813/2013, (EC) n° 811/2013, (EC) n° 812/2013 and (EC) n° 814/2013.

The safety operation of the boiler or water heater is not covered by this standard. Safety should be proved by means of the essential safety requirements of the Gas Appliances Regulation 2016/426/UE. This may be achieved by compliance with the appropriate existing harmonized standards.

NOTE Useful standards are series EN 15502 and series EN 12309.

Introduction

This document refers to clauses of prEN 13203-2:2020 or adapts clauses by stating in the corresponding clause, on the principle:

— shall be according to prEN 13203-2:2020, (clause number) with the following modification;

— shall be according to prEN 13203-2:2020, (clause number) with the following addition;

— prEN 13203-2:2020, (clause number) is replaced by the following;

— prEN 13203-2:2020, (clause number) is not applicable.

1 Scope

This document is applicable to gas-fired appliances producing domestic hot water. It applies to sorption heat pumps connected to or including a domestic hot water storage tank. It applies to a package marketed as single unit or fully specified that have:

— a heat input not exceeding 400 kW; and

— a hot water storage tank capacity (if any) not exceeding 2000 l.

In the case of combination boilers, with or without storage tank, domestic hot water production is integrated or coupled, the whole being marketed as a single unit.

EN 13203-1 sets out in qualitative and quantitative terms the performance in delivery of domestic hot water for a selected 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 the appliances. It defines a number of daily load profiles 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. Where other technologies are combined with a gas-fired boiler or a water heater to produce domestic hot water, specific parts of EN 13203 apply.

Horizontal ground heat sources are not covered by the scope of the present European Standard.

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.

prEN 13203-2:2020, *Gas-fired domestic appliances producing hot water - Part 2: Assessment of energy consumption*

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

EN 14511-2:2018, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 2: Test conditions*

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

EN 14511-4:2018, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 4: Operating requirements, marking and instructions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13203-2:2020 and the following apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
indoor ambient air
heat source for a heat pump which absorbs heat by a heat exchanger in direct contact with the air inside a building without any dedicated duct

3.2
brine
heat transfer medium which has a freezing point depressed relative to water

3.3
sorption heat pump
encased assembly or assemblies designed as an appliance whose primary function is delivery of domestic hot water or domestic hot water and heating, where the primary function is dependent on circulation of fluid (refrigerant and/or solution) within the absorption, adsorption or refrigerant circuit(s)

3.4
gas-fired sorption heat pump combined with a gas-fired appliance
appliance which is either placed on the market or specified as a complete package to deliver safely and effectively domestic hot water and/or heating, comprising as relevant:

— gas-fired sorption heat pump;

— gas-fired appliance;

— ducts if appropriate;

— thermal store

3.5
ground heat source
heat source of a sorption heat pump for which a heat exchanger, vertically embedded into the ground, is used to extract heat from the surrounding soil or rock by way of a brine circuit through the evaporator

3.6
solar collector source
heat source of a sorption heat pump for which a solar thermal collector is used to capture radiation energy from the sun by way of a brine circuit through the evaporator

3.7
external static pressure difference (Δp_{ext})
positive pressure difference measured between the air (or water) outlet section and the air (or water) inlet section of the unit, which is available for overcoming the pressure drop of any additional ducted air (or water) circuit

3.8
internal static pressure difference (Δp_{int})
negative pressure difference measured between the air (or water) outlet section and the air (or water) inlet section of the unit, which corresponds to the total pressure drop of all components on the air (or water) side of the unit

4 General test conditions

4.1 Reference conditions

Shall be according to prEN 13203-2:2020, 4.1, with the following additions:

The tests shall be carried out at the test conditions specified in Table 1 as appropriate.

Table 1 — Test conditions for particular types of systems

Type of heat source	Heat source temperature (°C)	Range of ambient temperature for heat pump (°C)	Ambient temperature of storage tank a) (°C)
Outside air (heat pump indoor) with air duct	7 ± 0,2 (6 ± 0,3)	20 ± 3	20 ± 3
Outside air (heat pump outdoor)	7 ± 0,2 (6 ± 0,3)	7 ± 3	20 ± 3
Exhaust air	20 ± 0,2 (12 ± 0,3)	20 ± 3	20 ± 3
Water (inlet)	10 ± 0,15	20 ± 3	20 ± 3
Brine (inlet)	0 ± 0,15	20 ± 3	20 ± 3
Ground heat source b) (Brine, inlet)	7 ± 0,2	20 ± 3	20 ± 3
Solar collector source c) (Brine, inlet)	12 ± 0,2	20 ± 3	20 ± 3

a) In case of outside storage tank the temperature shall be 7 ± 0,2 °C.

b) Applies to vertical ground heat exchanger with extraction rates lower than 35 W/m, for which brine return temperatures don't fall below 4°C after 25 years of operation (VDI 4046-2:2001).

c) Applies to aperture area to heat extraction ratios of > 3 m^2/kW for flat plate collectors and > 2 m^2/kW for vacuum tube collectors.

NOTE 1 All heat source temperatures are inlet temperatures in °C.

NOTE 2 All air temperatures in (brackets) are wet bulb temperatures in °C.

4.2 Measurement uncertainties

4.2.1 General

Shall be according to prEN 13203-2:2020, 4.2.1, with the following additions:

— air as heat source dry bulb temperature: ± 0,2 K;

— air as heat source wet bulb temperature: ± 0,3 K;

— water/brine as heat source: ± 0,15 K;

— brine from ground or solar source: ± 0,2 K.

4.2.2 Steady-state conditions

Shall be according to prEN 13203-2:2020, 4.2.2.

4.3 Test conditions

4.3.1 General

Shall be according to prEN 13203-2:2020, 4.3.1, except the second sentence modified as follows:

"**For gas fired appliances combined with gas heat pump**, the tests shall be ...".

and the following sentences added:

"If liquid heat transfer media other than water is used, the specific heat capacity and density of such heat transfer media shall be determined and taken into consideration in the evaluation."

When the gas-fired sorption heat pump combined with a gas-fired appliance does not operate in heat pump mode for domestic hot water production according to data in Table 1, the test shall be performed according to EN 13203-2 instead."

4.3.2 Test room

Shall be according to prEN 13203-2:2020, 4.3.2, with the following additions:

"If the package incorporates an air source outdoor heat exchanger a further test room is needed. The size of this test room shall be designed to avoid any resistance to air flow at the air inlet and air outlet orifices of the test object. The air flow through this room shall not cause any short circuit between the two orifices, and therefore the velocity of air flow at these two locations shall not exceed 1,5 m/s when the test object is switched off. The air velocity in the room shall also not be greater than the mean velocity through the unit inlet.

Unless otherwise stated in the technical documentation, the air inlet and air outlet orifices shall not be less than 1 m from the surfaces of the test room; this also applies to any measuring ducts.

For sorption heat pumps separated from the storage tank, the liquid flow rate has to be set on the liquid outlet side of the heat pump to the nominal flow rate specified in the installation and/or operation manual.

The sorption heat pump and/or package shall be installed and connected for the test as specified in the installation instructions.

Temperature and pressure measuring points shall be situated in order to obtain significant mean values.

Set points for internal control equipment of the unit such as thermostats, pressure switches or mixing valves shall be set to the values stated in the installation and/or operation instructions.

Air and entrained gases shall be removed from all water and other heat transfer liquid systems.

Each water pipe shall be installed in accordance with the installation instructions to the maximum stated length or 5 m whichever is shorter. Thermal insulation shall be applied to the pipes in accordance with the installation instructions."

4.3.3 Water supply

Shall be according to prEN 13203-2:2020, 4.3.3

4.3.4 Initial adjustment of the appliance

Shall be according to prEN 13203-2:2020, 4.3.4

4.3.5 Conditions for the determination of the maximum load profile

Shall be according to prEN 13203-2:2020, 4.3.5.

4.3.6 Electrical supply

Shall be according to prEN 13203-2:2020, 4.3.6

5 Determination of the energy consumption of the appliance

5.1 General

prEN 13203-2:2020, 5.1, is replaced by the new clause as follows:

"**5.1 Basic principles for the measurements of the performance**

This clause defines the test methods to apply for the determination of the energy consumption of the covered appliances which consists of the following two preparation tests and the four measurement tests.

— [P1] Filling and storage volume (see 5.1.2);

— [P2] Stabilization at cold conditions (see 5.1.3);

— [M1] Heating up (see 5.1.4);

— [M2] Standby mode for electrical power input and gas input measurements (see 5.1.5);

— [M3] Tapping cycle application with all water draw-offs according to prEN 13203-2:2020, 5.2;

— [M4] Mixed water at 40 °C and reference hot water temperature (see 7.7).

The measurement steps 1 to 4 are performed according to in Figure 1.

Each individual test can be performed independently provided that its starting conditions are the same as the ending conditions of the tests just before.