



SLOVENSKI STANDARD
oSIST prEN 16905-3:2023
01-november-2023

**Toplotna črpalka s plinsko gnanim motorjem z notranjim zgorevanjem - 3. del:
Preskusni pogoji**

Gas-fired endothermic engine driven heat pumps - Part 3: Test conditions

Gasbefeuerte endothermische Motor-Wärmepumpen - Teil 3: Prüfbedingungen

Pompes à chaleur à moteur endothermique alimenté au gaz - Partie 3 : Conditions
d'essai

Ta slovenski standard je istoveten z: prEN 16905-3

[oSIST prEN 16905-3:2023](https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023)

<https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023>

ICS:

27.080

Toplotne črpalke

Heat pumps

oSIST prEN 16905-3:2023

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 16905-3

October 2023

ICS 27.080

Will supersede EN 16905-3:2017

English Version

Gas-fired endothermic engine driven heat pumps - Part 3: Test conditions

Pompes à chaleur à moteur endothermique alimenté
au gaz - Partie 3 : Conditions d'essai

Gasbefeuerte endothermische Motor-Wärmepumpen -
Teil 3: Prüfbedingungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 299.

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, Türkiye 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	3
Introduction	4
1 Scope	5
1.1 Scope of EN 16905 series	5
1.2 Scope of EN 16905-3	5
2 Normative references	6
3 Terms and definitions	6
4 Test conditions	6
4.1 Environmental conditions and electrical power supply requirements	6
4.2 Rating conditions in cooling and in heating	8
4.3 Rating conditions for engine heat recovery	17
Annex ZA (informative) Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 813/2013 aimed to be covered	18
Annex ZB (informative) Relationship between this European Standard and the energy labelling requirements of Commission Delegated Regulation (EU) No 811/2013 aimed to be covered	19
Annex ZC (informative) Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2016/2281 aimed to be covered	20
Bibliography	21

Document Preview

[oSIST prEN 16905-3:2023](https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023)

<https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023>

European foreword

This document (prEN 16905-3:2023) has been prepared by Technical Committee CEN/TC 299 “Gas-fired sorption appliances, indirect fired sorption appliances, gas-fired endothermic engine heat pumps and domestic gas-fired washing and drying appliances”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 16905-3:2017.

prEN 16905-3:2023 includes the following significant technical changes with respect to EN 16905-3:2017:

- editorial and technical changes throughout the draft and in Annexes ZA and ZB in order to align the text to the Ecodesign Requirements stated in Commission Regulation (EU) 813/2013 and to the Energy Labelling Requirements stated in Commission Regulation (EU) No 811/2013;
- addition of Annex ZC in order to align the text to the Ecodesign requirements for energy-related products stated in Commission Regulation (EU) No 2016/2281.

This document has been prepared under a standardization request addressed to [the relevant ESO] 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 Annex ZA, ZB and ZC, which is an integral part of this document.

iteh Standards
(<https://standards.iteh.ai>)
Document Preview

[oSIST prEN 16905-3:2023](https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023)

<https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023>

prEN 16905-3:2023 (E)

Introduction

The GEHP appliances having their condenser cooled by air and by the evaporation of external additional water are not covered by this document.

Single split and multisplit systems are covered by this document.

The GEHP appliances can have one or more primary or secondary functions.

This European Standard specifies the requirements, test methods and test conditions concerning, in particular, the construction, safety, fitness for purpose, and rational use of energy, for the rating and performance calculation of air conditioners and heat pumps using either air, water or brine as heat transfer media, with gas-fired endothermic engine driven compressors when used for space heating, cooling and refrigeration, hereafter referred to as “GEHP appliance”.

EN 16905 comprises the following parts under the general title, Gas-fired endothermic engine driven heat pumps:

- Part 1: Terms and definitions;
- Part 2: Safety;
- Part 3: Tests conditions;
- Part 4: Tests methods;
- Part 5: Calculation of seasonal performances in heating and cooling mode.

prEN 16905-3:202x has been prepared to address the test conditions.

EN 16905-1:202x, EN 16905-2:202x, prEN 16905-3:202x, EN 16905-4:202x and EN 16905-5:2022 are linked to the Energy Related Products Directive (2009/125/EC) in terms of tests conditions, tests methods and seasonal performances calculation methods under Mandate M/535; (see prEN 16905-3:202x, Annex ZA, EN 16905-4:202x, Annex ZA, EN 16905-5:2022, Annex ZA and EN 16905-2:202x, Annexes ZB and ZC).

These documents will be reviewed whenever new mandates could apply.

1 Scope

1.1 Scope of EN 16905 series

This European Standard specifies the requirements, test methods and test conditions for the rating and performance calculation of gas-fired endothermic engine driven heat pumps for heating and/or cooling mode including the engine heat recovery, to be used outdoor.

This European Standard is to be used in conjunction with:

- a) the terms and definitions, EN 16905-1:202x;
- b) the safety, EN 16905-2:202x;
- c) the requirements, test conditions and test methods, EN 16905-4:202x;
- d) the calculation of seasonal performances in heating and cooling mode, EN 16905-5:2022.
- e) the heat pump standards, EN 14511-2:2022, EN 14511-3:2022 and EN 14825:2022.

This European Standard only applies to appliances with a maximum heat input (based on net calorific value) not exceeding 70 kW at standard rating conditions.

This European Standard only applies to appliances under categories I_{2H}, I_{2E}, I_{2Er}, I_{2R}, I_{2E(S)B}, I_{2L}, I_{2LL}, I_{2ELL}, I_{2E(R)B}, I_{2ESi}, I_{2E(R)}, I_{3P}, I_{3B}, I_{3B/P}, II_{2H3+}, II_{2Er3+}, II_{2H3B/P}, II_{2L3B/P}, II_{2E3B/P}, II_{2ELL3B/P}, II_{2L3P}, II_{2H3P}, II_{2E3P} and II_{2Er3P} according to EN 437:2021.

This European Standard only applies to appliances having:

- a) gas fired endothermic engines under the control of fully automatic control systems;
- b) closed system refrigerant circuits in which the refrigerant does not come into direct contact with the fluid to be cooled or heated;
- c) where the temperature of the heat transfer fluid of the heating system (heating water circuit) does not exceed 105 °C during normal operation;
- d) where the maximum operating pressure in the
 - 1) heating water circuit (if installed) does not exceed 6 bar;
 - 2) domestic hot water circuit (if installed) does not exceed 10 bar.

This European Standard applies to appliances only when used for space heating or space cooling or for refrigeration, with or without heat recovery.

This European Standard is applicable to appliances that are intended to be type tested. Requirements for appliances that are not type tested would need to be subject to further consideration.

1.2 Scope of EN 16905-3

This part of the EN 16905 series specifies the test conditions for the rating of energy parameters of gas-fired endothermic engine driven heat pumps for heating and/or cooling mode including the engine heat recovery.

prEN 16905-3:2023 (E)

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 16905-1:202x,¹ *Gas-fired endothermic engine driven heat pumps — Part 1: Terms and definitions*

EN 16905-4:202x,² *Gas-fired endothermic engine driven heat pumps — Part 4: Test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16905-1:202x 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/>

4 Test conditions

4.1 Environmental conditions and electrical power supply requirements

The tests shall be carried out under the environmental conditions specified in Table 1 or Table 2 depending on the location of the unit.

For all units, electrical power voltage and frequency shall be stated in the instructions.

iteh Standards
(<https://standards.iteh.ai>)
Document Preview

[oSIST prEN 16905-3:2023](https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023)

<https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023>

¹ Currently in preparation.

² Currently in preparation.

Table 1 — Environmental conditions and electrical power supply requirements for units designed for installation indoors

Type	Measured quantities	Rating test
Water-to-water and brine-to-water units ^a	Dry bulb temperature	15 °C to 30 °C
Water-to-air and brine-to-air units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Water-to-air and brine-to-air units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 6 and Table 7)
Air-to-water units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Air-to-water units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Tables 12 to 15)
Air-to-air units with duct connection on the outdoor air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Air-to-air units without duct connection on the outdoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As inlet temperature see Table 3 and Table 4
All appliances	Voltage	Rated voltage
All appliances	Frequency	Rated frequency
^a Rating conditions for water to water or water to brine appliances can be extended to brine to water and brine to brine appliances respectively (e.g. for reversible applications).		

<https://standards.iteh.ai/catalog/standards/sist/c4d8a2ee-bf92-4663-99c9-de4dfecb890b/osist-pren-16905-3-2023>

Table 2 — Environmental conditions and electrical power supply requirements for units designed for installation outdoors

Type	Measured quantities	Rating test
Air-to-water units	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Tables 12 to 14 and Table 15)
Water-to-air units	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 6 and Table 7)
Water-to-water and brine-to-water operating in cooling mode ^a	Dry bulb temperature	15 °C to 30 °C
Water-to-water and brine-to-water operating in heating mode	Dry bulb temperature	0 °C to 7 °C
Air-to-air units with duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 3 and Table 4)
All appliances	Voltage	Rated voltage
All appliances	Frequency	Rated frequency
^a Rating conditions for water to water or water to brine appliances can be extended to brine to water and brine to brine appliances respectively (e.g. for reversible applications).		

4.2 Rating conditions in cooling and in heating

For the rating tests, the appropriate test conditions shall be applied in accordance with:

- Table 3 for air-to-air units and air-cooled multisplit systems in heating mode;
- Table 4 for air-to-air units and air-cooled multisplit systems in cooling mode;
- Table 5 for air-to-air simultaneous heating and cooling mode multisplit systems;
- Table 6 for Water(brine)-to-air units and water (brine)-cooled multisplit systems in heating mode;
- Table 7 for Water(brine)-to-air units and water (brine)-cooled multisplit systems in cooling mode;
- Tables 8 to 10 for Water(brine)-to-water(brine) units in heating mode, depending on the temperature applications;
- Table 11 for Water (brine)-to-water(brine) heat pumps in cooling mode;
- Tables 12 to 14 for air-to-water units in heating mode, depending on the temperature applications;
- Table 15 for Air-to-water (brine) units in cooling mode.

For units with brine, the test shall be carried out with the brine specified in the instruction, see EN 16905-4:202x, 4.5.1.6.

NOTE 1 For air-to-water, brine-to-water and water-to-water units, the instructions declare the water temperatures levels (lower, medium, high) applicable to the heating mode.