



**SLOVENSKI STANDARD**  
**oSIST prEN 16905-1:2023**  
**01-januar-2023**

---

**Toplotna črpalka s plinsko gnanim motorjem z notranjim zgorevanjem - 1. del:  
Izrazi in definicije**

Gas-fired endothermic engine driven heat pumps - Part 1: Terms and definitions

Gasbefeuerte endothermische Motor-Wärmepumpen - Teil 1: Begriffe

Pompes à chaleur à moteur endothermique alimenté en gaz - Partie 1 : Termes et définitions

**Ta slovenski standard je istoveten z: prEN 16905-1**

**ICS:**

01.040.27	Prenos energije in toplote (Slovarji)	Energy and heat transfer engineering (Vocabularies)
27.080	Toplotne črpalke	Heat pumps

**oSIST prEN 16905-1:2023**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 16905-1**

December 2022

ICS 01.040.27; 27.080

Will supersede EN 16905-1:2017

English Version

## Gas-fired endothermic engine driven heat pumps - Part 1: Terms and definitions

Pompes à chaleur à moteur endothermique alimenté  
en gaz - Partie 1 : Termes et définitions

Gasbefeuerte endothermische Motor-Wärmepumpen -  
Teil 1: Begriffe

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

<b>Contents</b>		Page
<b>European foreword</b> .....		3
<b>Introduction</b> .....		4
<b>1</b>	<b>Scope</b> .....	5
<b>1.1</b>	<b>Scope of the EN 16905 series</b> .....	5
<b>2</b>	<b>Normative references</b> .....	5
<b>3</b>	<b>Terms and definitions</b> .....	6
<b>3.1</b>	<b>Appliance and its constituents</b> .....	6
<b>3.2</b>	<b>Combustion products circuit</b> .....	10
<b>3.3</b>	<b>Adjusting, monitoring, control and safety devices</b> .....	10
<b>3.4</b>	<b>Operation of the GEHP appliance</b> .....	13
<b>3.5</b>	<b>Gases</b> .....	16
<b>3.6</b>	<b>Conditions of operation, measurement and calculations</b> .....	17
<b>4</b>	<b>Denomination</b> .....	41
<b>Bibliography</b> .....		42
<b>Index</b> .....		43

ITeH STANDARD PREVIEW  
(standards.iteh.ai)

[oSIST prEN 16905-1:2023](https://standards.iteh.ai/catalog/standards/sist/5b30bae2-a5db-4bb2-be27-857110e496fe/osist-pren-16905-1-2023)

<https://standards.iteh.ai/catalog/standards/sist/5b30bae2-a5db-4bb2-be27-857110e496fe/osist-pren-16905-1-2023>

## European foreword

This document (prEN 16905-1:2022) 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 16905-1:2017.

This document includes the following significant technical changes with respect to EN 16905-1:2017:

- new definitions added in subclause 3.1, 3.4, 3.5 and 3.6;
- modifications of existing definitions in subclause 3.6.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[oSIST prEN 16905-1:2023](https://standards.iteh.ai/catalog/standards/sist/5b30bae2-a5db-4bb2-be27-857110e496fe/osist-pren-16905-1-2023)

<https://standards.iteh.ai/catalog/standards/sist/5b30bae2-a5db-4bb2-be27-857110e496fe/osist-pren-16905-1-2023>

**prEN 16905-1:2022 (E)****Introduction**

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

Single split and multisplit systems are covered by this European Standard.

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”.

The EN 16905 series 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.*

This document has been prepared to address the definitions used in all parts.

prEN 16905-1:2022, FprEN 16905-2:2022, EN 16905-3:2017, prEN 16905-4:2022 and FprEN 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 EN 16905-3:2017, Annex ZA, prEN 16905-4:2022, Annex ZA, FprEN 16905-5:2022, Annex ZA and FprEN 16905-2:2022, Annexes ZB and ZC).

These documents will be reviewed whenever new mandates could apply.

## 1 Scope

### 1.1 Scope of the EN 16905 series

This part of EN 16905 specifies the terms and definitions 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 specifies the terms and definitions.

This European Standard is to be used in conjunction with the following standards:

- a) FprEN 16905-2:2022 on safety;
- b) EN 16905-3:2017 on test conditions;
- c) prEN 16905-4:2022 on the requirements, test conditions and test methods;
- d) FprEN 16905-5:2022 on the calculation of seasonal performances in heating and cooling mode;
- e) the heat pump standards, EN 14511-2, EN 14511-3 and EN 14825.

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.

This European Standard only applies to appliances having:

- f) gas fired endothermic engines under the control of fully automatic control systems;
- g) closed system refrigerant circuits in which the refrigerant does not come into direct contact with the fluid to be cooled or heated;
- h) where the temperature of the heat transfer fluid of the heating system (heating water circuit) does not exceed 105 °C during normal operation;
- i) 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 GEHP appliances only when used for space heating or space cooling or for refrigeration, with or without heat recovery.

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

## 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 Appliance and its constituents

##### 3.1.1

##### **air conditioner**

encased assembly or assemblies designed as a unit to provide delivery of conditioned air to an enclosed space (room for instance) or zone

Note 1 to entry: It includes a refrigeration system for cooling and possibly dehumidifying the air.

Note 2 to entry: It can have means for heating, circulating, cleaning and humidifying the air. If the unit provides heating by reversing the refrigerating cycle, then it is a heat pump.

##### 3.1.2

##### **close control air conditioner**

air conditioner to satisfy the requirements of the process carried out in the air conditioned room

##### 3.1.3

##### **control cabinet air conditioner**

air conditioner to satisfy the requirements of the control cabinet

##### 3.1.4

##### **double-duct air conditioner**

air conditioner in which, during cooling or heating, the condenser (or evaporator) intake air is introduced from the outdoor environment to the unit by a duct and rejected to the outdoor environment by a second duct, and which is placed wholly inside the place to be conditioned, near a wall

##### 3.1.5

##### **engine heat recovery**

recovery of residual heat energy from the engine by means of a heat exchanger

##### 3.1.6

##### **engine heat recovery heat exchanger**

heat exchanger assembly which is designed to transfer the residual heat energy to the engine heat recovery medium

##### 3.1.7

##### **exhaust air**

air from the air conditioned space entering the outdoor heat exchanger

##### 3.1.8

##### **brine**

heat transfer medium that has a freezing point lower than the freezing point of water



**3.1.9****gas carrying circuit**

assembly of parts of the GEHP appliance that carry or contain supplied gas or process gas

Note 1 to entry: This circuit includes the gas circuit.

**3.1.10****gas circuit**

assembly of parts of the GEHP appliance that carry or contain the supplied gas between the gas inlet connection and the outlet of the safety shut-off valves

**3.1.11****gas inlet connection**

part of the GEHP appliance intended to be connected to the gas supply

**3.1.12****gas rate adjuster**

component allowing the gas rate of a gas mixture equipment to be brought to a predetermined value according to the supply conditions

Note 1 to entry: The action of operating this device is called "adjustment of the gas rate".

Note 2 to entry: e.g. gas mixer.

**3.1.13****GEHP appliance**

gas-fired endothermic engine driven heat pump

**3.1.14****heat pump**

encased assembly or assemblies designed as a unit to provide delivery of heat

Note 1 to entry: It includes a refrigeration system for heating.

Note 2 to entry: It can have means for cooling, circulating, cleaning and dehumidifying the air. The cooling is by means of reversing the refrigerating cycle.

**3.1.15****heat recovery**

recovery of heat rejected by the unit whose primary control is in the cooling mode by means of either an additional heat exchanger (e.g. a liquid chiller with an additional condenser) or by transferring the heat through the refrigerating system for use by units whose primary control remains in heating mode (e.g. variable refrigerant flow with simultaneous cooling and heating operation)

**3.1.16****heat recovery heat exchanger**

heat exchanger assembly which is designed to transfer heat to the heat recovery medium

**3.1.17****heat transfer medium**

medium (water, air ...) used for the transfer of the heat without changing the state

**prEN 16905-1:2022 (E)****3.1.18****ignition device**

means (e.g. electrical, etc.) used to ignite the gas admitted to the internal combustion engine

**3.1.19****indoor heat exchanger**

heat exchanger which is designed to transfer heat between the refrigerant and the indoor heat transfer medium

Note 1 to entry: In the case of an air conditioner operating in the cooling mode, this is the evaporator. In the case of an air conditioner operating in heating mode, this is the condenser.

Note 2 to entry: In case the indoor heat transfer is water or brine, the indoor heat exchanger is also placeable at outdoor.

**3.1.20****injector**

component that admits gas into an internal combustion engine

**3.1.21****internal combustion engine**

mechanism delivering shaft power by the combustion of fuel in one or more cylinders in which working pistons reciprocate

**3.1.22****multi-split system**

split system incorporating more than one indoor units, one or more refrigerant circuits, one or more compressors, and one or more outdoor units

Note 1 to entry: The indoor units can be individually controlled or not.

**3.1.23****outdoor heat exchanger**

heat exchanger which is designed to transfer heat between any available heat source and the refrigerant

Note 1 to entry: In the case of an air conditioner operating in the cooling mode, this is the condenser. In the case of an air conditioner operating in heating mode, this is the evaporator.

**3.1.24****primary function**

main purpose for which the GEHP appliance is designed

Note 1 to entry: Both the heating and cooling functions of the GEHP appliance are classed as primary functions if they satisfy the rational use of energy requirements for those functions.

**3.1.25****range-rating device**

component on the GEHP appliance intended to be used by the installer to adjust the nominal heat input (value of the heat input at standard rating condition) of the GEHP appliance within the range of maximum and minimum heat inputs stated in the technical specifications/instructions, to suit the actual heat requirements of the installation

**3.1.26****recycled air**

air from the air conditioned space entering the indoor heat exchanger

**3.1.27****sealing an adjuster or control device**

arrangements made to make evident any attempt to change the set adjustment (e.g. breakage of the device or the sealing material)

Note 1 to entry: A sealed adjuster or control device is considered to be non-existent.

**3.1.28****secondary function**

optional function of the GEHP appliance, such as heating or cooling, which is not expected to satisfy the rational use of energy requirements of a primary function

**3.1.29****single-duct air conditioner**

air conditioner in which, during cooling or heating, the condenser (or evaporator) intake air is introduced from the space containing the unit and discharged outside this space

**3.1.30****single split unit**

factory assembly of components of refrigeration system fixed on two mountings to form a discrete matched functional unit

**3.1.31****simultaneously heating and cooling mode multi-split system**

split system air conditioner or heat pump incorporating a single refrigerant circuit, at least one variable speed compressor or an alternate compressor combination for varying the capacity of the system by three or more steps, multiple indoor units, each capable of being individually controlled and one or more outdoor units

Note 1 to entry: This system is capable of operating as a heat pump where recovered heat from the indoor units operating in the cooling mode can be transferred to one or more units operating in the heating mode.

Note 2 to entry: This may be achieved by a gas/liquid separator or a third line in the refrigeration circuit.

**3.1.32****water loop**

closed circuit of water maintained with a temperature range on which the units in cooling mode reject heat and the units in heating mode take heat

**prEN 16905-1:2022 (E)****3.2 Combustion products circuit****3.2.1****air supply and combustion products evacuation ducts**

means for transporting combustion air to the internal combustion engine and the combustion products to the terminal or fitting piece

Note 1 to entry: It is necessary to distinguish between:

- completely surrounded ducts: the combustion products evacuation duct is surrounded by combustion air throughout its length,
- separate ducts: the combustion products evacuation duct and the combustion air supply duct are neither concentric nor completely surrounded ducts.

**3.2.2****backflow valve**

valve to prevent flue gas backflow

**3.2.3****combustion chamber**

enclosure inside which combustion of the air-gas mixture takes place

**3.2.4****combustion circuit**

circuit including the air supply duct and the combustion products circuit

**3.2.5****combustion products circuit**

circuit including the combustion chamber, the heat exchanger, the combustion products evacuation duct and either the fitting piece or the connection to the terminal, if any

**3.2.6****terminal**

part of the combustion circuit fitted external to the building which has the function of the air supply inlet and/or combustion products outlet of the appliance

**3.2.7****terminal guard**

device that protects the terminal from physical damage from outside influences

**3.3 Adjusting, monitoring, control and safety devices****3.3.1****adjustable pressure regulator**

pressure regulator fitted with a means of adjusting the downstream pressure

Note 1 to entry: This means is considered as an “adjusting device”.

**3.3.2****adjustable control thermostat**

control thermostat that permits the user to obtain setting temperatures between a minimum and a maximum value

**3.3.3****air proving device**

device intended to cause safety shutdown in the event of abnormal conditions of air admission or of combustion products evacuation

**3.3.4****automatic engine control system**

system that comprises a programming unit and the combustion detection function

Note 1 to entry: All the functions of an automatic control system are assembled in one or more housings.

**3.3.5****automatic shut-off valve**

device that automatically opens, closes or varies a rate on a signal from the engine control system

Note 1 to entry: Automatic valves are classified in accordance with EN 161 into classes A, B, C, D and J.

**3.3.6****breather hole**

orifice that allows atmospheric pressure to be maintained in a compartment of variable volume

**3.3.7****closure member**

movable part of the valve or the thermoelectric device that opens, varies or shuts off the gas path

**3.3.8****control knob**

component intended to be moved by hand in order to act on an appliance control (e.g. tap, thermostat, etc.)

**3.3.9****control thermostat**

device enabling the water temperature to be kept automatically within a given range at a predetermined value

**3.3.10****diaphragm**

flexible component that operates a valve by means of a force resulting from a pressure difference

**3.3.11****external soundness**

soundness, with respect to the atmosphere, of an enclosure containing gas

**3.3.12****fault tolerating time**

time between the occurrence of a fault and the shut-down of the internal combustion engine which is tolerated by the application without creating a hazardous situation

**3.3.13****gas/air ratio control**

device that automatically adapts the combustion air rate to the gas rate or vice versa