

SLOVENSKI STANDARD

SIST EN 14511-2:2018

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Nadomešča:
SIST EN 14511-2:2013

Klimatske naprave, enote za hlajenje kapljevine, toplotne črpalke za ogrevanje in hlajenje prostora ter procesne hladilne naprave z električnimi kompresorji - 2. del: Preskusni pogoji

Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions

iTeh STANDARD PREVIEW

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen für die Raumbeheizung und -kühlung und Prozess-Kühler mit elektrisch angetriebenen Verdichtern - Teil 2: Prüfbedingungen

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Climatiseurs, groupes refroidisseurs de liquide et pompes à chaleur pour le chauffage et le refroidissement des locaux et refroidisseurs industriels avec compresseur entraîné par moteur électrique - Partie 2: Conditions d'essai

Ta slovenski standard je istoveten z: EN 14511-2:2018

ICS:

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27.080	Toplotne črpalke	Heat pumps
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

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EUROPEAN STANDARD

EN 14511-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions

Climatiseurs, groupes refroidisseurs de liquide et pompes à chaleur pour le chauffage et le refroidissement des locaux et refroidisseurs industriels avec compresseur entraîné par moteur électrique -
Partie 2: Conditions d'essai

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen für die Raumbeheizung und -kühlung und Prozess-Kühler mit elektrisch angetriebenen Verdichtern - Teil 2: Prüfbedingungen

This European Standard was approved by CEN on 31 December 2017.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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This European Standard exists 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.

<https://standards.iteh.ai/catalog/standards/sist/4700e2af-0d72-4efb-89bc-b0d156f8a121>

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

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European foreword

This document (EN 14511-2:2018) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by UNE.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2018, and conflicting national standards shall be withdrawn at the latest by March 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14511-2:2013.

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 Regulation(s).

For relationship with EU Regulation(s), see informative Annexes ZA and ZB, which are an integral part of this document.

The main change with respect to the previous edition is the inclusion of process chillers in the scope of the standard with a table of relevant test conditions.

EN 14511, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors* currently comprises the following parts:

- *Part 1: Terms and definitions* [SIST EN 14511-2:2018](https://standards.iteh.ai/catalog/standards/sist/4700e2af-0d72-4efb-89bc-e51915ff8adb/sist-en-14511-2-2018)
- *Part 2: Test conditions*
- *Part 3: Test methods*
- *Part 4: Requirements*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 the United Kingdom.

EN 14511-2:2018 (E)**1 Scope**

1.1 The scope of EN 14511-1 is applicable.

1.2 This European Standard specifies the test conditions for the rating of air conditioners, liquid chilling packages and heat pumps, using either, air, water or brine as heat transfer media, with electrically driven compressors when used for space heating and/or cooling. The standard also specifies the test conditions for the rating of air-cooled and water(brine)-cooled process chillers.

1.3 This European Standard specifies the conditions for which performance data is to be declared for single duct and double duct units for compliance to the Ecodesign Regulation 206/2012 and Energy Labelling Regulation 626/2011.

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

EN 14511-4:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 4: Requirements*

EN 15218, *Air conditioners and liquid chilling packages with evaporatively cooled condenser and with electrically driven compressors for space cooling — Terms, definitions, test conditions, test methods and requirements*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14511-1:2018 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>

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 given by the manufacturer.

Table 1 — Environmental conditions for units designed for installation indoors

Type	Measured quantities	Rating test
Water(brine)-to-water(brine) units	Dry bulb temperature	15 °C to 30 °C
Air-to-water(brine) units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Air-to-water(brine) units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	15 °C to 30 °C
Water(brine)-to-air units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Water(brine)-to-air units without duct connection on the air inlet and outlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 5 or Table 6)
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 or Table 4)
Air-cooled process chillers ducted on the air side	Dry bulb temperature	15 °C to 30 °C
Water(brine)-cooled process chillers	Dry bulb temperature	15 °C to 30 °C

Table 2 — Environmental conditions for units designed for installation outdoors

Type	Measured quantities	Rating test
Air-to-water(brine) units	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Tables 12 to 16)
Water(brine)-to-air units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 5 and Table 6)
Water(brine)-to-water(brine) units operating in cooling mode	Dry bulb temperature	15 °C to 30 °C
Water(brine)-to-water(brine) units 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)
Air-cooled process chillers (non-ducted on the air side)	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 25)
Water(brine)-cooled process chillers	Dry bulb temperature	15 °C to 30 °C

4.2 Rating conditions

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

- Table 3 for air-to-air units in heating mode;

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- Table 4 for air-to-air units in cooling mode;
- Table 5 for water(brine)-to-air units in heating mode;
- Table 6 for water(brine)-to-air units in cooling mode;
- Tables 7 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) units in cooling mode;
- Tables 12 to 15 for air-to-water(brine) in heating mode, depending on the temperature applications;
- Table 16 for air-to-water(brine) units in cooling mode;
- Table 17 for liquid chilling packages with remote condenser;
- Table 18 for liquid chilling packages for heat recovery condenser;
- Table 19 for air-cooled multisplit systems and modular air-cooled multisplit systems in the heating mode;
- Table 20 for air-cooled multisplit systems and modular air-cooled multisplit systems in the cooling mode;
- Table 21 for modular heat recovery air-cooled multisplit systems;
- Table 22 for water-cooled multisplit systems and modular water-cooled multisplit systems in the heating mode;
- Table 23 for water-cooled multisplit systems and modular water-cooled multisplit systems in the cooling mode;
- Table 24 for modular heat recovery water-cooled multisplit systems.
- Table 25 for process chillers

For units with brine, the test shall be carried out with the brine specified by the manufacturer, see EN 14511-4:2018, 7.2.1.

For air-to-water(brine), and water(brine)-to-water(brine) heat pumps, the manufacturer may declare the water(brine) temperatures levels (low, intermediate, medium, and high) applicable to the heating mode.

NOTE For comparison purposes between reverse cycle and non-reverse cycle units, the conditions on the water(brine) side are given by the inlet and outlet water(brine) temperatures, possibly leading to different water(brine) flow rates in heating and cooling modes.

The rating tests in heating mode also apply for units having evaporatively cooled condenser, which performance in cooling mode is determined in accordance with EN 15218, and which can operate in heating mode.

The standard rating conditions, extracted from Table 3 for heating mode and specified in Table ZA.1, shall be used to determine the rated capacity (P_{rated}), the rated power input (P_{COP}), the rated coefficient of performance (COP_{rated}) and the electricity consumption (Q_{BD} , Q_{SD}) in heating mode.

Table 3 — Air-to-air units - Heating mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Outdoor air / recycled air (e.g. window, double duct, split units)	7	6	20	15 max
	Exhaust air / recycled air (e.g. single duct heat pump)	20	12	20	12
	Exhaust air / outdoor air	20	12	7	6
Application rating conditions	Outdoor air / recycled air (e.g. window, double duct, split units)	2	1	20	15 max.
	Outdoor air / recycled air (e.g. window, double duct, split units)	- 7	- 8	20	15 max.
	Outdoor air / recycled air (e.g. window, double duct, split units)	- 15	—	20	15 max.
	Outdoor air / recycled air (e.g. window, double duct, split units)	12	11	20	15 max.
	Exhaust air / outdoor air	20	12	2	1
	Exhaust air / outdoor air	20	12	- 7	- 8

Table 4 — Air-to-air units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Comfort (outdoor air / recycled air) (e.g. window, double duct, split units)	35	24 ^a	27	19
	Comfort (exhaust air / recycled air)	27	19	27	19
	Comfort (exhaust air / outdoor air)	27	19	35	24
	Single duct ^{b, c}	35	24	35	24
	Control cabinet	35	24	35	24
	Close control	35	24	24	17
Application rating conditions	Comfort (outdoor air / recycled air) (e.g. window, double duct, split units)	27	19 ^a	21	15
	Single duct ^{b, c}	27	19	27	19
	Comfort (outdoor air / recycled air) (e.g. window, double duct, split units)	46	24 ^a	29	19
	Control cabinet	50	30	35	24
	Close control	27	19	21	15

^a The wet bulb temperature condition is not required when testing units which do not evaporate condensate.

^b When using the calorimeter room method, pressure equilibrium between indoor and outdoor compartments shall be obtained by introducing into indoor compartment, air at the same rating temperature conditions.

^c The pressure difference between the two compartments of the calorimeter room shall not be greater than 1,25 Pa. This pressure equilibrium can be achieved by using an equalizing device or by creating an open space area in the separation partition wall, which dimensions shall be calculated for the maximum airflow of the unit to be tested. If an open space is created in the partition wall, an air sampling device or several temperature sensors shall be used to measure the temperature of the air from the outdoor compartment to the indoor compartment.

Table 5 — Water(brine)-to-air units - Heating mode

		Outdoor heat exchanger		Inlet heat exchanger	
		Inlet temperature	Outlet temperature	Inlet dry bulb temperature	Inlet wet bulb temperature
		°C	°C	°C	°C
Standard rating conditions	Water ^a	10	7	20	15 max.
	Brine	0	-3	20	15 max.
	Water loop	20	17	20	15 max.
Application rating conditions	Water	15	^b	20	15 max.
	Brine	5	^b	20	15 max.

^a The term “water” includes indifferently water from a river or a lake, ground water.

^b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

Table 6 — Water(brine)-to-air units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature	Outlet temperature	Inlet dry bulb temperature	Inlet wet bulb temperature
		°C	°C	°C	°C
Standard rating conditions	Cooling tower	30	35	27	19
	Ground coupled (water or brine)	10	15	27	19
	Control cabinet	15	20	35	24
	Close control	30	35	24	17
Application rating conditions	Cooling tower	40	^a	27	19
	Ground coupled (water or brine)	15	^a	27	19
	Close control	15	^a	21	15
	Close control	40	^a	24	17

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.