SLOVENSKI STANDARD
oSIST prEN 14511-2:2015

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Klimatske naprave, enote za tekočinsko hlajenje in toplotne črpalke z električnimi kompresorji za segrevanje in hlajenje prostora - 2. del: Preskusni pogoji

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

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

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: **prEN 14511-2**

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23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne črpalke	Heat pumps
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning

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EUROPEAN STANDARD

NORME EUROPÉENNE

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English Version

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 113.

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.

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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.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (prEN 14511-2:2015) has been prepared by Technical Committee CEN/TC 113 "Heat pumps and air conditioning units", the secretariat of which is held by AENOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede 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 No 206/2012.

For relationship with EU Regulation No 206/2012, see informative Annex ZA, which is an integral part of this document.

The main changes with respect to the previous edition are listed below:

— the inclusion of process chillers in the scope of the standard with a table of relevant test conditions.

Although this document has been prepared in the frame of the Commission Regulation (EU) No 206/2012 implementing Directive 2009/125/EC with regard to ecodesign requirements for air conditioners and comfort fans, it is also intended to support the Essential Requirements of the European Directive 2010/30/EU.

prEN 14511 currently comprises the following parts:

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

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

— *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 3: Test methods*,

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

1 Scope

1.1 The scope of prEN 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-cooled process chillers.

1.3 This European Standard specifies the conditions for which performance data shall 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 14511-1:2015, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers using electrically driven compressors — Part 1: Terms and definitions*

prEN 14511-4:2015, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 14511-1:2015 apply.

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-to-water and brine-to-water units	Dry bulb temperature	15 °C to 30 °C
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	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 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-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 units	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Tables 12 to 15 and Table 16)
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 5 and Table 6)
Water-to-water and brine-to-water operating in cooling mode	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)
Air-cooled process chillers (non-ducted on the air side)	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 25)
Water-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;

— Table 4 for air-to-air units in cooling mode;

— Table 5 for water-to-air and brine-to-air units in heating mode;

— Table 6 for water-to-air and brine-to-air units in cooling mode;

— Tables 7 to 10 for water-to-water and brine-to-water units in heating mode, depending on the temperature applications;

— Table 11 for water-to-water, brine-to-water, water-to-brine and brine-to-brine units in cooling mode;

— Tables 12 to 15 for air-to-water in heating mode, depending on the temperature applications;

— Table 16 for air-to-water and air-to-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 prEN 14511-4:2015, 7.2.1.

For air-to-water, brine-to-water and water-to-water heat pumps, the manufacturer may declare the water 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 side are given by the inlet and outlet water temperatures, possibly leading to different water 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_{DD}, 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-to-air and brine-to-air units - Heating mode

		Outdoor heat exchanger		Inlet heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °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 or water in a close water loop.

[b] The test is performed at the flow rate obtained during the test at the corresponding standard rating conditions

Table 6 — Water-to-air and brine-to-air units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °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 at the water flow rate obtained during the test at the corresponding standard rating conditions.