SLOVENSKI STANDARD
oSIST prEN 14511-2:2009

01-november-2009

Klimatske naprave, enote za tekoļ insko hlajenje in toplotne ļ rpalke z elektriļ nimi 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 - Part 2: Test conditions

Luftkonditionerer, Flüssigkeitskühlsätze und Wärmepumpen mit elektrisch angetriebenen Verdichtern für die Raumbehezung und Kühlung - Teil 2: Prüfbedingungen

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

Ta slovenski standard je istoveten z: prEN 14511-2

ICS:

23.120	Zraļ niki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne ļ rpalke	Heat pumps
91.140.30	Prezraļ evalni in klimatski sistemi	Ventilation and air-conditioning

oSIST prEN 14511-2:2009 en,fr

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 14511-2

September 2009

ICS 91.140.30

Will supersede EN 14511-2:2007

English Version

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

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

Luftkonditionerer, Flüssigkeitskühlsätze und Wärmepumpen mit elektrisch angetriebenen Verdichtern für die Raumbehezung und Kühlung - Teil 2: Prüfbedingungen

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland 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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 14511-2:2009: E

Contents

Page

Foreword

This document (prEN 14511-2:2009) 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 14511-2:2007.

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 2002/31/EC.

For relationship with EU Directive 2002/31/EC, see informative Annex ZA, which is an integral part of this document.

prEN 14511 comprises the following parts under the general title "*Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling*“:

— Part 1: Terms and definitions

— Part 2: Test conditions

— Part 3: Test methods

— Part 4: Requirements

1 Scope

1.1 The scope of prEN 14511-2:2009 is applicable.

1.2 This part of prEN 14511 specifies the test conditions for the rating of air and water cooled air conditioners, liquid chilling packages, air-to-air, water-to-air, air-to-water and water-to-water heat pumps with electrically driven compressors when used for space heating and/or cooling. It also specifies test conditions for heat recovery operation of multisplit systems.

2 Normative references

The following referenced documents are indispensable for the application 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 14511-1:2009, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 1: Terms and definitions*

prEN 14511-3:2009, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 3: Test methods*

prEN 14511-4:2009, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 4: Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 14511-1:2009 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	Inlet temperatures (see Tables 12 to 15 or Table 16)
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 temperatures (see Table 5 or Table 6)
Air-to-air units with duct connection on the indoor air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Air-to-air units without duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As inlet temperatures see Table 3 or Table 4

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 temperatures (see Tables 12 to 15 and Table 15)
Water-to-air and brine-to-air units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	Inlet temperatures (see Table 5 and Table 6)
Water-to-water and brine-to-water operating in cooling mode	Dry bulb temperature	25 °C to 35 °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 temperatures (see Table 3 and Table 4)

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 basic, multiple circuit and modular air-cooled multisplit systems in the heating mode;

— Table 20 for basic, multiple circuit and modular air-cooled multisplit systems in the cooling mode;

— Table 21 for modular heat recovery air-cooled multisplit systems;

— Table 22 for basic, multiple circuit and modular water-cooled multisplit systems in the heating mode;

— Table 23 for basic, multiple circuit and modular water-cooled multisplit systems in the cooling mode.

For units with brine, the test shall be carried out with the brine specified by the manufacturer, see 7.2.1 of prEN 14511-4:2009.

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	Outside 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	Outside air / recycled air (e.g. window, double duct, split units)	2	1	20	15 max.
	Outside air / recycled air (e.g. window, double duct, split units)	- 7	- 8	20	15 max.
	Outside air / recycled air (e.g. window, double duct, split units)	- 15	-	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 (outside 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 (outside air / recycled air) (e.g. window, double duct, split units)	27	19 [a]	21	15
	Single duct [b, c]	27	19	27	19
	Comfort (outside 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 equalising 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	10	7/ [a]	20	15 max.
	Brine	0	-3/ [a]	20	15 max.
	Water loop	20	17/ [a]	20	15 max.
Application rating conditions	Water	15	[b]	20	15 max.
	Brine	5	[b]	20	15 max.

[a] For units designed for heating and cooling mode, the flow rate obtained during the test at standard rating conditions in cooling mode (see Table 6) is used.

[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.

Table 7 — Water-to-water and brine-to-water units - Heating mode

		Outdoor heat exchanger		Indoor heat exchanger low temperature applications	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water [a]	10	7	30	35
	Brine	0	-3	30	35
Application rating conditions	Water	15	[b]	[b]	35
	Brine	5	[b]	[b]	35

[a] The term “water” includes either water from a river or a lake, either 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 8 — Water-to-water and brine-to-water units - Heating mode (Medium temperature)

		Outdoor heat exchanger		Indoor heat exchanger medium temperature applications	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water [a]	10	7[b]	40	45
	Brine	0	-3 [b]	40	45
Application rating conditions	Water	15	[c]	[c]	35
	Brine	5	[c]	[c]	35

[a] The term "water" includes indifferently water from a river or a lake, ground water or water in a close water loop

[b] For units designed for heating and cooling mode, the flow rate obtained during the test at standard rating conditions in cooling mode (see Table 11) is used.

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

Table 9 — Water-to-water and brine-to-water units - Heating mode (High temperatures)

		Outdoor heat exchanger		Indoor heat exchanger High temperature applications	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water [a]	10	7	47	55
	Brine	0	-3	47	55
Application rating conditions	Water	15	[b]	[b]	55
	Brine	5	[b]	[b]	55

[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 10 — Water-to-water and brine-to-water units - Heating mode (Very high temperature)

		Outdoor heat exchanger		Indoor heat exchanger Very high temperature applications	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water [a]	10	7	50	65
	Brine	0	-3	50	65
Application rating	Water	15	[b]	[b]	65
conditions	Brine	5	[b]	[b]	65

[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