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Luftkonditioneringsaggregat och vätskekylare med evaporativt kyld kondensor och med elmotordrivna kompressorer för rumskylning – Termer, definitioner, provningsförhållanden, provningsmetoder och krav

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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Denna standard ersätter SS-EN 15218:2006, utgåva 1.

The European Standard EN 15218:2013 has the status of a Swedish Standard. This document contains the official version of EN 15218:2013.

This standard supersedes the Swedish Standard SS-EN 15218:2006, edition 1.

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EUROPEAN STANDARD

EN 15218

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2013

ICS 27.200; 91.140.30

Supersedes EN 15218:2006

English Version

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

Climatiseurs et groupes refroidisseurs de liquide à condenseur refroidi par évaporation et compresseur entraîné par moteur électrique pour la réfrigération des locaux - Termes, définitions, conditions d'essai, méthodes d'essai et exigences

Luftkonditionierer und Flüssigkeitskühlsätze mit verdunstungsgekühltem Verflüssiger und elektrisch angetriebenen Verdichtern für die Raumkühlung - Begriffe, Prüfbedingungen, Prüfverfahren und Anforderungen

This European Standard was approved by CEN on 30 May 2013.

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.

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.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15218:2013) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by AENOR.

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 January 2014 and conflicting national standards shall be withdrawn at the latest by January 2014.

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

This document supersedes EN 15218:2006.

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

- a) the addition of requirements related to the electrical consumption and the air flow rate measurement of ducted units;
- b) the addition of a table template containing the test results of the ducted units;
- c) the addition of an Annex Z related to the Commission Regulation (EC) n°206/2012.

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(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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/CE.

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

SS-EN 15218:2013 (E)

1 Scope

This European Standard specifies the terms, definitions, test conditions, test methods and requirements for rating the performance of air conditioners and liquid chilling packages, with electrically driven compressors and with evaporatively cooled condenser when used for space cooling. The evaporatively cooled condenser is cooled by air and by the evaporation of external additional water. This additional external water is fed by a specific water supply circuit or by a water tank.

This European Standard does not apply to air-to-air and air-to-water air conditioners with a condenser cooled by air and by the evaporation of water condensed on their evaporator.

This European Standard applies to units equipped with a water tank or with a continuous water circuit supply that can also operate without water feeding. However the standard only concerns the testing of these units with water feeding.

This European Standard applies to factory-made units which can be ducted.

This European Standard applies to factory-made units of either fixed capacity or variable capacity by any means.

Packaged units, single split and multisplit systems are covered by this European Standard.

With regard to units consisting of several parts, this European Standard applies only to those designed and supplied as a complete package.

Evaporatively cooled condenser units that can also operate in heating mode shall have their performance in this mode determined according to EN 14511.

Installations used for industrial processes cooling are not within the scope of this European Standard.

This European Standard specifies the conditions for which performance data shall be declared for compliance to the Ecodesign regulation 206/2012 and to the Energy Labelling regulation 626/2011 of air conditioners with evaporatively cooled condenser in cooling mode.

NOTE All the symbols given in this text can be used regardless of language.

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.

EN 14511-1:2013, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 1: Terms, definitions and classification*

EN 14511-2, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 2: Test conditions*

EN 14511-3:2013, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 3: Test methods*

EN 14511-4:2013, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 4: Operating requirements, marking and instructions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14511-1:2013 and the following apply.

3.1

evaporatively cooled condenser

heat exchanger that condenses refrigerant vapour by rejecting heat to a water and air mixture causing the water to evaporate and increase the enthalpy of air

Note 1 to entry: Desuperheating and sub-cooling of the refrigerant may also occur.

3.2

water tank

tank designed as an integral part of the unit to contain external additional water which is fed to the evaporatively cooled condenser

3.3

continuous supply water circuit

circuit designed as an integral part of the unit to feed continuously the evaporatively cooled condenser with water from an external water source

3.4

effective power input

P_E

average electrical power input of the unit within a defined interval of time obtained from:

- power input for operating the compressor;
- power input for all control and safety devices of the unit;
- power input of the circulating pump which provides water to the evaporatively cooled condenser, if any;
- proportional power input of the conveying devices (e.g. fans, pumps) for ensuring the transport of the heat transfer media inside the unit, expressed in Watt.

Note 1 to entry: For the purposes of this standard the present definition replaces the one in EN 14511-1 and is used to calculate the EER and EER_{rated} .

3.5

cleaning cycle

interval of time during which water is sprayed on the evaporatively cooled condenser in order to remove fouling and scale buildup

3.6

functioning cycle

interval of time elapsed between the start of two successive cleaning cycles for evaporatively cooled condenser units with a continuous water supply

4 Classification

If the heat transfer medium for the indoor heat exchanger is water, the unit shall be denominated as evaporatively cooled condenser liquid chilling package.

If the heat transfer medium for the indoor heat exchanger is air, the unit shall be denominated as evaporatively cooled condenser air conditioner.

SS-EN 15218:2013 (E)

5 Test conditions

5.1 Environmental conditions and electrical power supply requirements

The tests shall be carried out under the environmental conditions specified in Table 1 or Table 2 based 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 indoor installation

Type	Measured quantities	Rating test
Evaporatively cooled condenser liquid chilling packages with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Evaporatively cooled condenser liquid chilling packages without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 5 or Table 6
Evaporatively cooled condenser air conditioners with duct connection on the indoor air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Evaporatively cooled condenser air conditioners without duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 3 or Table 4

Table 2 — Environmental conditions for units designed for outdoor installation

Type	Measured quantities	Rating test
Evaporatively cooled condenser liquid chilling packages	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 5 and Table 6
Evaporatively cooled condenser air conditioners with duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As inlet temperatures, see Table 3 and Table 4

5.2 Rating conditions

For the rating tests, the appropriate test conditions apply in accordance with Table 3 and Table 4 for evaporatively cooled condenser air conditioners or with Table 5 and Table 6 for evaporatively cooled condenser liquid chilling packages.

Table 3 –Evaporatively cooled condenser air conditioner with continuous water supply circuit

		Evaporatively cooled condenser			Indoor heat exchanger	
		Air		Water		
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Comfort (outdoor air / recycled air) – double duct	35	24	15	27	19
	Comfort (exhaust air / recycled air)	27	19	15	27	19
	Comfort (exhaust air / outdoor air)	27	19	15	35	24
	Single duct ^{a, b}	35	24	15	35	24
	Control cabinet	35	24	15	35	24
	Close control	35	24	15	24	17
Application rating conditions	Comfort (outdoor air / recycled air) – double duct	27	19	15	21	15
	Single duct	27	19	15	27	19
	Comfort (outdoor air / recycled air) – double duct	46	24	15	29	19
	Control cabinet	50	30	15	35	24
	Close control	27	19	15	21	15

^a 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.

^b 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

The external additional water supply on the evaporatively cooled condenser shall be set as specified in 6.2.2.