

BS EN 14511-2:2011



BSI Standards Publication

Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling

Part 2: Test conditions

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

National foreword

This British Standard is the UK implementation of EN 14511-2:2011. It supersedes BS EN 14511-2:2007, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/17, Testing of air conditioning units.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2011

ISBN 978 0 580 68417 3

ICS 91.140.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2011.

Amendments issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14511-2

October 2011

ICS 91.140.30

Supersedes 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

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

This European Standard was approved by CEN on 20 August 2011.

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.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Test conditions	4
4.1 Environmental conditions and electrical power supply requirements	4
4.2 Rating conditions.....	5
Annex A (normative) Energy labelling application	17
A.1 General.....	17
A.2 Rating conditions.....	17
A.2.1 General.....	17
A.2.2 Air-cooled air conditioners (air-to-air conditioners)	17
A.2.3 Single-duct (reversible) air conditioners.....	17
A.2.4 Water-cooled air conditioners (water-to-air conditioners)	17
A.2.5 Double duct air conditioners	18
A.3 Test procedure	18
A.4 Tolerances on declared values	18
A.4.1 General.....	18
A.4.2 First testing	18
A.4.3 Second testing	19
Bibliography	20

Foreword

This document (EN 14511-2:2011) 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 April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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 14511-2:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

EN 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.*

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

1.1 The scope of EN 14511-1:2011 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. 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.

EN 14511-1:2011, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 1: Terms and definitions*

EN 14511-3:2011, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling — Part 3: Test methods*

EN 14511-4:2011, *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 EN 14511-1:2011 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

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)

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.

For units with brine, the test shall be carried out with the brine specified by the manufacturer, see 7.2.1 of EN 14511-4:2011.

NOTE 1 For air-to-water, brine-to-water and water-to-water units, the manufacturer may declare the water temperatures levels (lower, medium, high and very high) applicable to the heating mode.

NOTE 2 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.