

# SVENSK STANDARD

## SS-EN 14511-4:2018



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### **Luftkonditioneringsaggregat, vätskekylare och värmepumpar, med elmotordrivna kompressorer, för rumsuppvärmning och kylning – Del 4: Funktionskrav**

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

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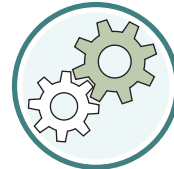
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Denna standard ersätter SS-EN 14511-4:2013, utgåva 4.

The European Standard EN 14511-4:2018 has the status of a Swedish Standard. This document contains the official version of EN 14511-4:2018.

This standard supersedes the Swedish Standard SS-EN 14511-4:2013, edition 4.

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EUROPEAN STANDARD

EN 14511-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2018

ICS 27.080; 91.140.30

Supersedes EN 14511-4:2013

English Version

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

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 4: Exigences

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen für die Raumbeheizung und -kühlung und Prozess-Kühler mit elektrisch angetriebenen Verdichtern - Teil 4: Anforderungen

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.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**SS-EN 14511-4:2018 (E)**

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## European foreword

This document (EN 14511-4:2018) 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 14511-4:2013.

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

The main change with respect to the previous edition is the revision and simplification of the tests.

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*
- *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.

## SS-EN 14511-4:2018 (E)

### 1 Scope

1.1 The scope of EN 14511-1 is applicable, with the exception of process chillers.

1.2 This European Standard specifies minimum operating requirements which ensure that air conditioners, heat pumps and liquid chilling packages using either air, water or brine as heat transfer media, with electrical driven compressors are fit for the use designated by the manufacturer when used for space heating and/or cooling.

### 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 12102, *Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling — Measurement of airborne noise — Determination of the sound power level*

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 14511-2:2018, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers, with electrically driven compressors — Part 2: Test conditions*

EN 14511-3:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 3: Test methods*

EN 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1)*

EN 60335-2-40, *Household and similar electrical appliances — Safety — Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers (IEC 60335-2-40)*

EN 61000-3-11, *Electromagnetic compatibility (EMC) — Part 3-11: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems — Equipment with rated current  $\leq 75$  A and subject to conditional connection (IEC 61000-3-11)*

### 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 Operating requirements

#### 4.1 General

Except where otherwise stated, tests shall be conducted as described in EN 14511-2 and EN 14511-3.



## 4.2 Temperature operating range

### 4.2.1 Starting and operating tests

#### 4.2.1.1 General

The unit shall be capable of starting and/or operating within the limit of use (temperatures and flows) specified by the manufacturer.

Rated voltage shall be set at the beginning of the test and maintained constant during the test.

The environmental conditions during the test shall be as specified in EN 14511-2:2018, Tables 1 and 2.

Air flow rates shall be the same as that used for the rating capacity test, as specified in EN 14511-2.

The temperatures shall be set at the beginning of the test and maintained constant during the test.

For a given air dry bulb temperature, the relative humidity shall be defined accordingly to Table 1 and used for the calculation of the wet bulb temperature to be set.

**Table 1 — Determination of wet bulb temperature related to dry bulb temperature**

Dry bulb temperature $T_{DB}$ °C	Wet bulb temperature $T_{WB}$ °C
$T_{DB} < -11$	Not defined
$-10 \leq T_{DB} \leq 12$	$T_{WB} = T_{DB} - 1$
$12 < T_{DB} \leq 20$	$T_{WB} = 0,34 * T_{DB} + 6,95$
$T_{DB} > 20$	$T_{WB} = 0,6414 * T_{DB} + 1,5931$

Deviation between individual values and set values shall be between:

- zero and minus twice the permissible deviation according to EN 14511-3:2018, Table 4 for the upper limit of use;
- zero and plus twice the permissible deviation according to EN 14511-3:2018, Table 4 for the lower limit of use.

Uncertainty of measurement shall be as specified in EN 14511-3:2018, Table 1.

The tests shall be performed at every condition stated in Tables 2 to 9, accordingly to the type of unit and in both cooling and heating mode, where applicable.

For a starting test, the unit shall start and operate in the temperature conditions stated in Tables 2 to 9 during 15 min.

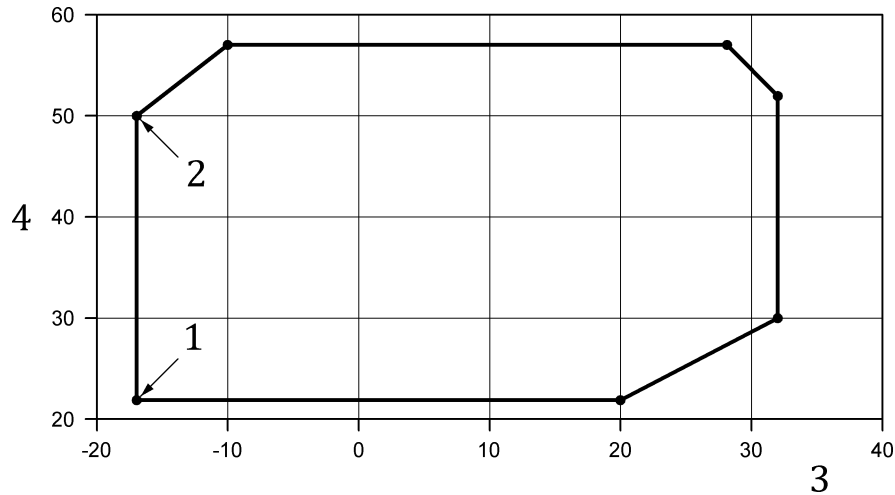
For an operating test, the unit shall be able to operate during 1h in the temperature conditions stated in Tables 2 to 5.

The unit motor shall operate without tripping of the motor overload protective devices.

#### 4.2.1.2 Heating mode

The following Figure 1 provides an example of the operating range as declared by the manufacturer. The temperature values are not necessarily relevant.

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- Key**
- 1, 2 test points
  - 3 inlet temperature at outdoor heat exchanger in °C
  - 4 inlet temperature at indoor heat exchanger in °C

**Figure 1 — Example of operating range of a unit in heating mode**

**Table 2 — Operational requirements conditions for air-to-air units**

Test point	Test
1	Starting
2	Operating

**Table 3 — Operational requirements conditions for air-to-water units**

Test point	Water flow rate at indoor heat exchanger	Test
1	Minimum	Starting
2	Minimum	Operating

**Table 4 — Operational requirements conditions for water(brine)-to-water units**

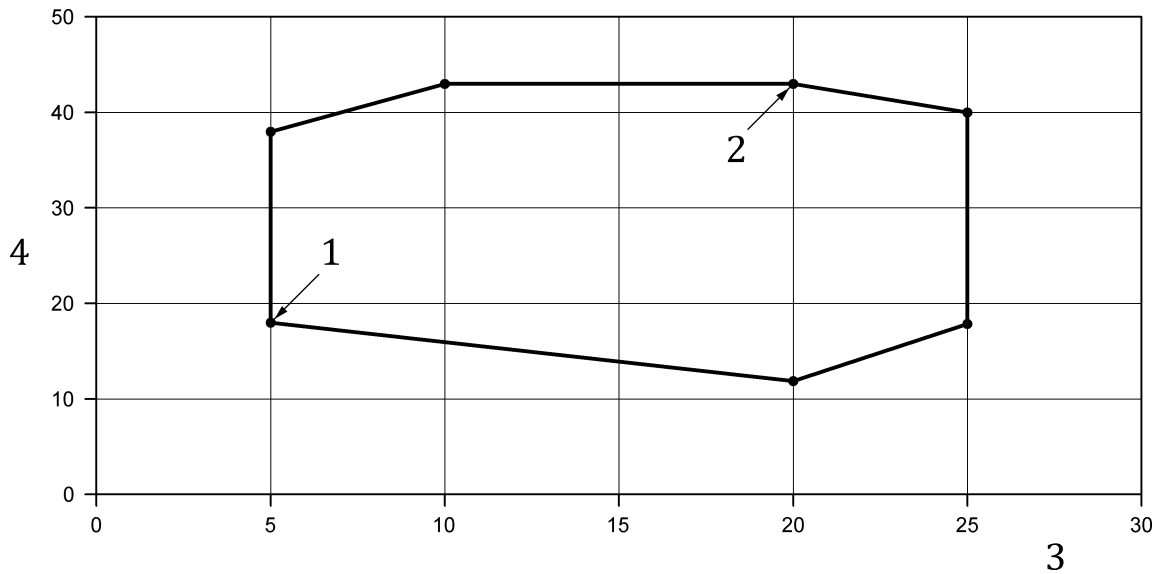
Test point	Water flow rate at indoor heat exchanger	Water flow rate at outdoor heat exchanger	Test
1	Minimum	Minimum	Starting
2	Minimum	Minimum	Operating

**Table 5 — Operational requirements conditions for water(brine)-to-air units**

Test point	Water flow rate at indoor heat exchanger	Test
1	Minimum	Starting
2	Minimum	Operating

**4.2.1.3 Cooling mode**

The following Figure 2 provides an example of the operating range as declared by the manufacturer. The temperature values are not necessarily relevant.



**Key**

- 1, 2 test points
- 3 inlet temperature at indoor heat exchanger in °C
- 4 inlet temperature at outdoor heat exchanger in °C

**Figure 2 — Example of operating range of a unit in cooling mode**

**Table 6 — Operational requirements conditions for air-to-air units**

Test point	Test
1	Starting
2	Starting

**Table 7 — Operational requirements conditions for air-to-water units**

Test point	Water flow rate at indoor heat exchanger	Test
1	Minimum	Starting
2	Maximum	Starting