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**Klimatske naprave, enote za tekočinsko hlajenje in toplotne črpalke za ogrevanje in hlajenje prostora in električni kompresorji za ogrevanje in hlajenje prostora - 4. del: Zahteve**

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

**Ta slovenski standard je istoveten z: prEN 14511-4**

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**ICS:**

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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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**

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.

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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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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (prEN 14511-4:2015) 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 14511-4:2013.

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 and Directive 2009/125/EC.

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

- a) the revision and simplification of the tests.

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, 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, 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 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*

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 14511-2:2015, *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*

prEN 14511-3:2015, *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 prEN 14511-1:2015 apply.

## 4 Operating requirements

### 4.1 General

Except where otherwise stated, tests shall be conducted as described in prEN 14511-2 and prEN 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) indicated by the manufacturer in the technical documentation (see 6.4).

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 prEN 14511-2:2015, Tables 1 and 2.

Air flow rates shall be the same as that used for the rating capacity test, as specified in prEN 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
$-10 \leq T_{DB} \leq 12$	$T_{WB} = T_{DB} - 1$
$12 < T_{DB} \leq 20$	$T_{WB} = 0,34 * T_{DB} + 6,95$
$T_{DB} > 20$	$T_{WB} = 0,86 * T_{DB} - 3,50$

Deviation between individual values and set values shall be between:

- zero and minus twice the permissible deviation according to prEN 14511-3:2015, Table 2 for the upper limit of use;
- zero and plus twice the permissible deviation according to prEN 14511-3:2015, Table 2 for the lower limit of use.

Uncertainty of measurement shall be as specified in prEN 14511-3:2015, 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.

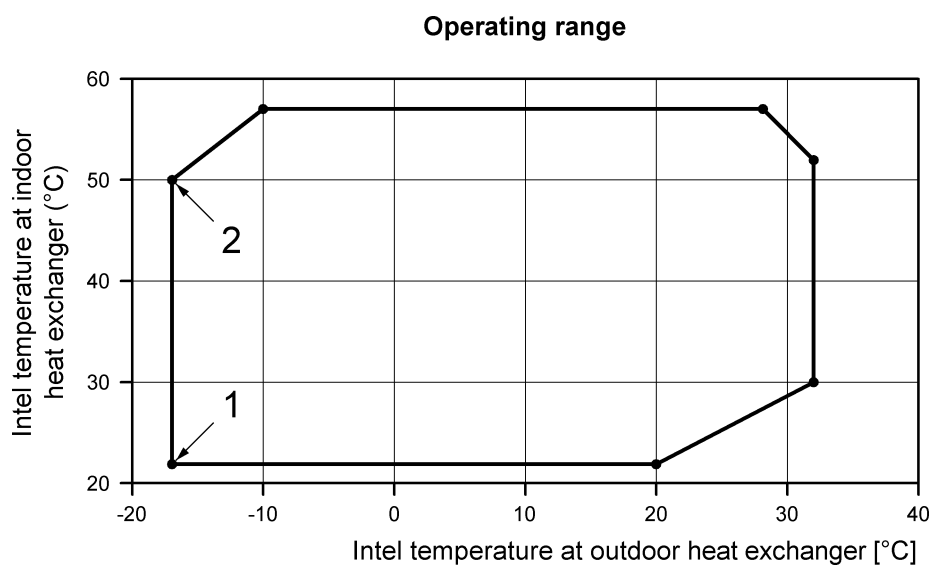
For a starting test, the unit shall start and operate in the temperature conditions stated in Tables 2 to 9 during 15 min.

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.



**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

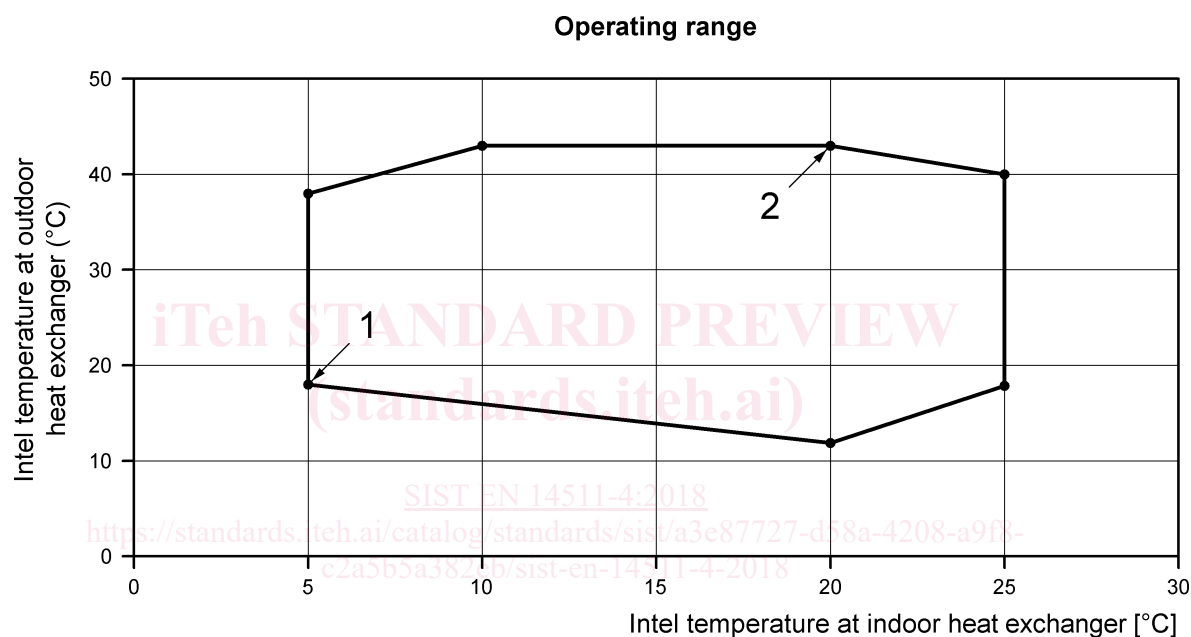


**Table 5 — Operational requirements conditions for water(brine)-to-air units**

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.

**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

**Table 8 — 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	Maximum	Minimum	Starting
2	Maximum	Minimum	Starting

**Table 9 — Operational requirements conditions for water(brine)-to-air units**

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

### 4.3 Outside the operating range

If operating outside the temperature range can cause damage to the unit, it shall be provided with safety devices which ensure that the unit suffers no damage when the operating limits of use indicated by the manufacturer are exceeded and remains capable of operating when coming back within these limits. A safety device that does not automatically reset may trip provided that a warning device is fitted.

The manufacturer shall indicate any safety devices provided and their operating conditions according to 7.2.3.

### 4.4 Freeze-up test in cooling mode

The test shall be performed on air-to-air and water(brine)-to-air units in the cooling mode for checking the consequences of a possible freeze-up of the air on the indoor side.

After the unit has operated for 6 h at the conditions stated in Table 10, or after the last freeze up cycle has completed after these 6 h, the following requirements shall be fulfilled: