

# SLOVENSKI STANDARD

## SIST EN 14511-4:2013

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Nadomešča:

SIST EN 14511-4:2012

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**Klimatske naprave, enote za tekočinsko hlajenje in toplotne črpalke z električnimi kompresorji za segrevanje in hlajenje prostora - 4. del: Operativne zahteve, označevanje in navodila**

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

**iTeh STANDARD PREVIEW**

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Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen mit elektrisch angetriebenen Verdichtern für die Raumbeheizung und -kühlung - Teil 4: Betriebsanforderungen, Kennzeichnung und Anleitung

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Climatiseurs, groupes refroidisseurs de liquide et pompes à chaleur avec compresseur entraîné par moteur électrique pour le chauffage et la réfrigération des locaux - Partie 4: Exigences de fonctionnement, marquage et instructions

**Ta slovenski standard je istoveten z: EN 14511-4:2013**

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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

**SIST EN 14511-4:2013**

**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14511-4**

August 2013

ICS 27.080; 91.140.30

Supersedes EN 14511-4:2011

English Version

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

Climatiseurs, groupes refroidisseurs de liquide et pompes à chaleur avec compresseur entraîné par moteur électrique pour le chauffage et la réfrigération des locaux - Partie 4: Exigences de fonctionnement, marquage et instructions

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen mit elektrisch angetriebenen Verdichtern für die Raumbeheizung und -kühlung - Teil 4: Betriebsanforderungen, Kennzeichnung und Anleitung

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

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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: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (EN 14511-4:2013) 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 February 2014 and conflicting national standards shall be withdrawn at the latest by February 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 14511-4:2011.

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

a) the updating of the normative references.

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, definitions and classification,*

— *Part 2: Test conditions,*

— *Part 3: Test methods,*

— *Part 4: Operating requirements, marking and instructions*

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.

**EN 14511-4:2013 (E)****1 Scope**

1.1 The scope of EN 14511-1 is applicable.

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*

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 14511-2:2013, *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 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1, modified)*

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, modified)*

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 14511-1:2013 apply.

**4 Operating requirements****4.1 General**

Except where otherwise stated, tests shall be conducted as described in EN 14511-1 and EN 14511-3.

## 4.2 Temperature operating range

### 4.2.1 Starting test

The unit shall be capable of operating within the limit of use (temperatures and flows) indicated by the manufacturer in the technical documentation (see 6.4).

For every condition stated in Table 1, and for both cooling and heating mode where applicable, the unit shall start up and operate for at least 30 min, without being stopped by the safety devices.

**Table 1 — Operational requirements conditions**

Type	Inlet temperature at outdoor heat exchanger °C	Outlet temperature at indoor heat exchanger °C	Water flow rate of air-to-water and water-to-water units	Voltage V
All types	Upper limit of use	Upper limit of use	Maximum	Rated voltage
All types	Lower limit of use	Lower limit of use	Minimum	Rated voltage

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

Test voltage shall be as specified in Table 1. It is set at the beginning of the test and maintained constant during the test.

The environmental conditions during the test shall be as specified in Tables 1 and 2 of EN 14511-2:2013.

Air flow rates shall be the same as that used for the rating capacity test, as specified in EN 14511-2:2013.

Deviation between individual values and set values shall be between:

- zero and minus twice the permissible deviation according to Table 2 of EN 14511-3:2013, for the upper limit of use;
- zero and plus twice the permissible deviation according to Table 2 of EN 14511-3:2013, for the lower limit of use.

Uncertainty of measurement shall be as specified in Table 1 of EN 14511-3:2013.

### 4.2.2 Test at maximum operating conditions (cooling mode)

When operated at conditions stated in Table 2 during 1 h, then switch off for 5 min, and then switched on again for 1 h, the unit shall meet the following requirements:

- the unit motor shall operate continuously for the first hour without tripping of the motor overload protective devices;
- after the shut-down period of 5 min, the unit shall restart automatically no more than 5 min after restarting of the compressor;
- the unit motor shall operate again continuously for the rest of the second hour without tripping of the motor overload protective devices.

NOTE When possible, switching off the unit is done through the control panel of the unit.

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Table 2 — Maximum operating conditions

Type	Inlet temperature at outdoor heat exchanger °C	Outlet temperature at indoor heat exchanger °C	Voltage V
Control cabinet air conditioner	Upper limit of use	35	Rated voltage
All other types	Upper limit of use	Upper limit of use	Rated voltage

This test can be combined with the corresponding starting test, except for control cabinet air conditioners where the inlet temperature at the indoor heat exchanger is lowered to 35 °C after the starting time.

## 4.2.3 Freeze-up test

## 4.2.3.1 Air-cooled unit

After the unit has operated for 6 h at the conditions stated in Table 3, and after the last freeze up cycle has completed, the following requirements shall be fulfilled:

- no ice shall have accumulated on the evaporator;
- no ice shall drip from the unit;
- no water shall drip or be blown off the unit into the room.

## 4.2.3.2 Water-cooled units

After the unit has operated for 6 h at the conditions stated in Table 3 the following requirements shall be fulfilled:

- air flow through the unit shall not have dropped by more than 5 %;

NOTE Ensure that air flow through the unit is not adjusted during the test by some automatic control device.

- the water temperature difference through the unit shall not have dropped by more than 30 %;
- the saturated temperature corresponding to the pressure measured at the suction of the compressor shall not have decreased by more than 2 K.

Table 3 — Freeze up test conditions

Unit type	Temperature at outdoor heat exchanger	Temperature at indoor heat exchanger °C		Air flow rate
		Air		
		Dry bulb	Wet bulb	
<b>All types</b>	Lowest limit of use	21	15	Lowest entering temperature Minimum setting as allowed by the manufacturer

For all units, electrical power voltage and frequency shall be given by the manufacturer.



### 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 Shutting off the heat transfer medium flows

To check the correct operating of the safety devices on the unit, the following faults shall be simulated consecutively. The unit shall have attained steady state in the standard rating conditions according to Tables 3 to 23 of EN 14511-2:2013 for 30 min before every fault is simulated. Each fault simulated shall be maintained for at least 1 h.

NOTE In case the unit is provided without flow switch but it is required by the manufacturer instructions, the unit is tested with an additional flow switch.

- a) Shutting off the heat transfer medium flow at the outdoor heat exchanger.
- b) Shutting off the heat transfer medium flow at the indoor heat exchanger.
- c) Shutting off the heat transfer medium flow at the heat recovery heat exchanger where applicable.

The unit is checked for any damage sustained during the test and if any safety devices have operated during the test. The unit shall suffer no damage and shall remain capable of operating after restoration of the flow rates. A safety device that does not automatically reset may trip provided that a warning device is fitted.

For units with defrosting system, an additional test shall be conducted at the test conditions specified in Table 4 by shutting off the heat transfer medium flow at the indoor heat exchanger, at the beginning of the defrosting phase.

**Table 4 — Shutting off the heat transfer medium flows**

Type of unit	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	Inlet water temperature °C	Outlet water temperature °C
Air-to-air units	2	1	20	15 max.		
Air-to-water units	2	1			a	45
Air-to-water units (for floor heating or similar application)	2	1			a	35

<sup>a</sup> The test is performed at the flow rate obtained during the test at the corresponding standard rating conditions.

### 4.5 Complete power supply failure

Complete power supply failure lasting approximately 5 s shall be simulated. The unit shall have attained steady state conditions before the fault simulation, at the standard rating condition according to Tables 3 to 23 of EN 14511-2:2013.

The unit has to restart automatically within 30 min. When the manufacturer states that the unit does not automatically restart, fault detection is necessary.