
Klimatske naprave, enote za hlajenje kapljevine, toplotne črpalke za ogrevanje in hlajenje prostora ter procesne hladilne naprave z električnimi kompresorji - 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

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen für die Raumbeheizung und -kühlung und Prozess-Kühler mit elektrisch angetriebenen Verdichtern - Teil 4: Anforderungen
(standards.iteh.ai)

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

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 systems |

oSIST prEN 14511-4:2021**en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 14511-4:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/fa948c4c-b8be-4b27-948b-d6c424ac4177/osist-pren-14511-4-2021>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 14511-4

March 2021

ICS

Will supersede EN 14511-4:2018

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 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.

This draft European Standard was established by CEN 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

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

Contents

| | |
|------------------------------------------------------------------|----|
| European foreword..... | 3 |
| 1 Scope | 4 |
| 2 Normative references..... | 4 |
| 3 Terms and definitions | 4 |
| 4 Operating requirements..... | 5 |
| 4.1 General..... | 5 |
| 4.2 Temperature operating range..... | 5 |
| 4.3 Outside the operating range | 8 |
| 4.4 Freeze-up test in cooling mode | 8 |
| 4.5 Shutting off the heat transfer medium flows | 9 |
| 4.6 Complete power supply failure..... | 9 |
| 4.7 Condensate draining and enclosure sweat test..... | 9 |
| 4.8 Other requirements | 10 |
| 5 Marking..... | 11 |
| 6 Technical data sheet | 11 |
| 6.1 General description..... | 11 |
| 6.2 Performance characteristics..... | 12 |
| 6.2.1 Rating characteristics..... | 12 |
| 6.2.2 Additional characteristics..... | 12 |
| 6.2.3 Sound characteristics | 12 |
| 6.3 Electrical characteristics | 12 |
| 6.4 Operating range..... | 12 |
| 7 Instructions | 13 |
| 7.1 General..... | 13 |
| 7.2 Physical description..... | 13 |
| 7.2.1 Refrigerant, air and/or liquid circuits..... | 13 |
| 7.2.2 Additional heating devices, when integral to the unit..... | 13 |
| 7.2.3 Control and safety | 13 |
| 7.3 Instructions for installation | 13 |
| 7.4 Instruction for maintenance | 14 |
| 7.5 Instructions to test houses..... | 14 |
| Bibliography | 15 |

iTeh STANDARD PREVIEW

(standards.itech.ai)

oSIST prEN 14511-4:2021

<https://standards.itech.ai/catalog/standards/sist/1a948c4c-b80c-4b27-948b-><doc+24ac41177/osist-prEN-14511-4-2021>

STANDARD PREVIEW

European foreword

This document (prEN 14511-4:2021) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by UNE.

This document is currently submitted to the Enquiry.

This document will supersede EN 14511-4:2018.

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;
- the Commission Regulation (EU) n° 626/2011 supplementing Directive 2010/30/EU with regard to energy labelling for air conditioners;
- the Commission Regulation (EU) No 813/2013 implementing Directive 2009/125/EC with regard to ecodesign requirements for air-to-water and water-to-water heat pump space heaters;
- the Commission Regulation (EU) n° 811/2013 supplementing Directive 2010/30/EU with regard to energy labelling for air-to-water and water-to-water heat pump space heaters;
- the Commission Regulation (EU) n° 2015/1095 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for process chillers;
- Commission Regulation (EU) 2016/2281 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units.

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*

prEN 14511-4:2021 (E)**1 Scope**

1.1 The scope of prEN 14511-1:2021 is applicable, with the exception of process chillers.

1.2 This document 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 12102-1:2017, *Air conditioners, liquid chilling packages, heat pumps, process chillers and dehumidifiers with electrically driven compressors - Determination of the sound power level - Part 1: Air conditioners, liquid chilling packages, heat pumps for space heating and cooling, dehumidifiers and process chillers*

prEN 14511-1:2021, *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*

prEN 14511-2:2021, *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*

prEN 14511-3:2021, *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 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016)*

prEN IEC 60335-2-40:2020, *Household and similar electrical appliances — Safety — Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers (IEC 60335-2-40:2018)*

EN IEC 61000-3-11:2019, *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 ≤ 75 A and subject to conditional connection (IEC 61000-3-11:2017)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 14511-1:2021 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 prEN 14511-2:2021 and prEN 14511-3:2021.

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 prEN 14511-2:2021, Tables 1 and 2.

Air flow rates shall be the same as that used for the rating capacity test, as specified in prEN 14511-2:2021.

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 prEN 14511-3:2021, Table 4 for the upper limit of use;
- zero and plus twice the permissible deviation according to prEN 14511-3:2021, Table 4 for the lower limit of use.

Uncertainty of measurement shall be as specified in prEN 14511-3:2021, 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.

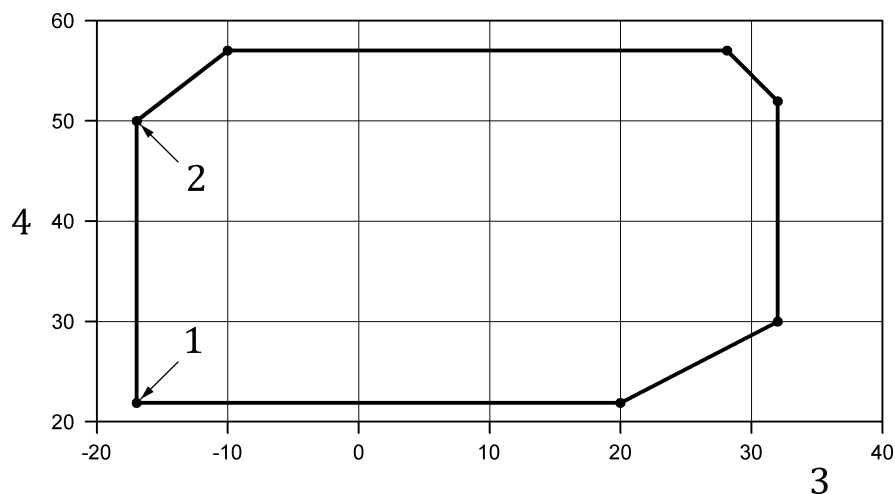
For an operating test, the unit shall be able to operate during 1h in the temperature conditions stated in Tables 2 to 5.

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

prEN 14511-4:2021 (E)

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.



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

oSIST prEN 14511-4:2021

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

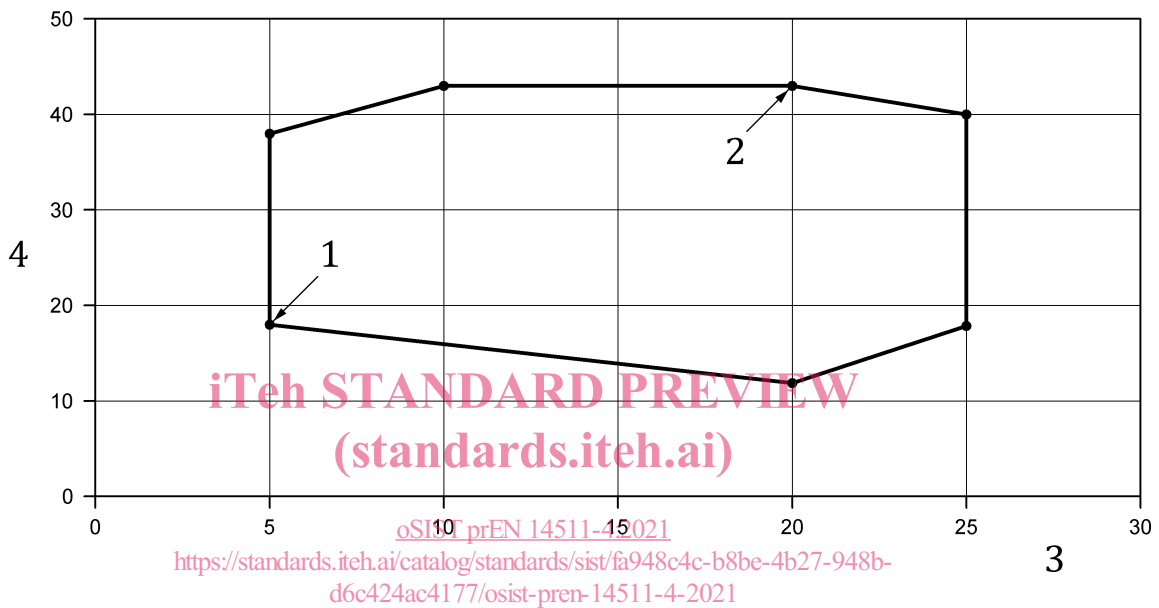
| Test point | Water flow rate at indoor heat exchanger | Water flow rate at outdoor heat exchanger | Test |
|------------|------------------------------------------|-------------------------------------------|-----------|
| 1 | Minimum | Minimum | Starting |
| 2 | Minimum | Minimum | Operating |

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 |

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:

- 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.

Table 10 — Freeze up test conditions

| Unit type | Temperature at outdoor heat exchanger | Indoor heat exchanger | | | |
|-----------|--------------------------------------------------------|-----------------------|----------------|------------------------------------------------|-----------------------|
| | | Air temperatures | | Air flow rate | Set point temperature |
| | | Dry bulb °C | Wet bulb °C | | |
| All types | Lowest condition of the operating range (see Figure 2) | 21 | 15 | Minimum setting as allowed by the manufacturer | Lowest set point |