SLOVENSKI STANDARD
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Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 3: Requirements

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Luftkonditionierer und Wärmepumpen mit elektrisch angetriebenen Verdichtern - Kühlen - Teil 3: Anforderungen

Climatiseurs et pompes a chaleur avec compresseur entraîné par moteur électrique - Mode réfrigération - Partie 3: Exigences

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English version

Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 3: Requirements

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This European Standard was approved by CEN on 1997-01-27. 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 Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Contents

Foreword

This European Standard has been prepared by Technical Committee by CEN/TC 113 "Heat pumps and air conditioners", the secretariat of which is held by AENOR.

This standard consists of the following parts:

EN 814-1 Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 1: Terms, definitions and designations

EN 814-2 Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 2: Testing and requirements for marking

EN 814-3 Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 3: Requirements

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of an identical text or by endorsement, at the latest by August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This part of EN 814 specifies minimum requirements which ensure that a air or water cooled air conditioner, air/air or water/air heat pump, with electrically driven compressor, is fitted for the use designated by the manufacturer, when used in cooling mode. When these units are used in heating mode by reversing the refrigerating cycle, then EN 255-4 applies.

This standard also specifies recommendations for the way the characteristics of units shall be specified by the manufacturer in order to assist users and manufacturers in the understanding and comparison of various types.

This standard applies to factory-made units which can be ducted. The units can be of the following specific types: comfort air conditioner or heat pump, spot air conditioner, single duct air conditioner, control cabinet air conditioner, close control air conditioner.

In the case of units consisting of several parts, the standard applies only to those designed and supplied as a complete package.

Units having two or more indoor sections connected to a single outdoor unit (multiple split system air conditioners or heat pumps) are excluded from this standard.

This standard does not apply to continuously variable capacity control units.

This standard does not apply to liquid chilling packages/units.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 255-1 Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors - Heating mode - Part 1: Terms, definitions and designations

EN 255-4 Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors - Heating mode - Part 4: Requirements for space heating and sanitary hot water units

EN 814-1 Air conditioners and heat pumps with electrically driven ccmpressors - Cooling mode - Part 1: Terms, definitions and designations

EN 814-2:1997 Air conditioners and heat pumps with electrically driven compressors - Cooling mode - Part 2: Testing and requirements for marking

EN 60335-2-40 Safety of household and similar electrical appliances - Part 2: Particular requirements for electrical heat pumps, air conditioners and dehumidifiers
(IEC 335-2-40:1992 modified)

ENV 12102 Air conditioner, heat pump and dehumidifiers with electrically driven compressors - Measurement of airborne noise - Determination of the sound power level

3 Definitions

For the purposes of this standard, the definitions given in EN 814-1 apply.

4 Requirements

4.1 General

Except where otherwise stated, tests shall be conducted as described in EN 814-2.

4.2 Temperature operating range

4.2.1 General

Units are tested at the limits described by tables 1, 2 and 3; the maximum operating test and the freeze up test can be combined with the corresponding starting tests, in that case, the first 20 min of the first hour is used to check the starting test.

The temperatures are set at the beginning of the test and maintained constant during the test, except for the test at maximum operating conditions of control cabinet air conditioners, where the inlet temperature at the evaporator is lowered to 35 °C after the starting test.

Test voltages shall be as specified in tables 1 to 3. They are set at the beginning of the test and maintained constant during the test.

The ambient conditions during the test shall be as specified in table 2 of EN 814-2:1997.

The flow rates shall be the same as that used for rating test, as specified in table 3 of EN 814-2:1997.

Deviation between individual values and set values shall be between:

- zero and minus twice the permissible deviation according to table 4 of EN 814-2:1997 (the upper limit of use);

- zero and plus twice the permissible deviation according to table 4 of EN 814-2:1997 (the lower limit of use).

Uncertainty of measurement shall be as specified in table 1 of EN 814-2:1997.

4.2.2 Starting test

The unit shall be capable of operating within the limits of use indicated by the manufacturer.

For every condition stated in table 1 the unit shall start up and operate for at least 20 min, without being stopped by the safety devices.

Table 1: Operational requirements conditions

Type	Temperature at condenser °C	Temperature at evaporator °C	Voltage V
All types	Upper limit of use	Upper limit of use	Rated voltage
All types	Lower limit of use	Lower limit of use	Rated voltage

4.2.3 Test at maximum operating conditions

When operated at conditions stated in table 2 during 1 h, then switch off for 3 min, and then switched on again for 1 h, the unit shall meet the following requirements:

- the unit shall suffer no damage;

- the unit motor shall operate continuously for the 1st hour without tripping of the motor overload protective devices;

- after the shut-down period of 3 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.

Table 2: Maximum operating conditions

Type	Temperature at condenser °C	Temperature at evaporator °C	Voltage V
Control cabinet air conditioner	Upper limit of use	35 °C	Rated voltage
All other types	Upper limit of use	Upper limit of use	Rated voltage

4.2.4 Freeze up test

After the unit has operated for 2 h at conditions stated in table 3, no ice shall have accumulated on the evaporator.

Table 3: Freeze up conditions

Type	Temperature at condenser °C	Temperature at evaporator °C	Voltage V
All types	Lower limit of use	Lower limit of use	Rated voltage

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 (see 6.1.2).

4.4 Shutting off the heat transfer media flows

4.4.1 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 conditions at (T1) according to prEN 814-2 table 3 before every fault is simulated. Each fault simulated shall be maintained for at least one hour:

a) shutting off the heat transfer medium flow at the condenser;

b) shutting off the heat transfer medium flow at the evaporator.