SLOVENSKI STANDARD
SIST EN 814-2:2001

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

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Luftkonditionierer und Wärmepumpen mit elektrisch angetriebenen Verdichtern - Kühlen - Teil 2: Prüfungen und Anforderungen an die Kennzeichnung

Climatiseurs et pompes a chaleur avec compresseur entraîné par moteur électrique - Mode réfrigération - Partie 2: Essais et exigences de marquage

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ICS:

23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne črpalke	Heat pumps

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EUROPEAN STANDARD

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ICS 23.120; 27.080; 91.140.30

Descriptors: air conditioning equipment, air conditioners, tests, testing conditions, installation, measurements, calorific power, marking

English version

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

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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of an identical text or by endorsement, at the latest by August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.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 methods for testing and reporting of the rating and specifies requirements for marking of air and water cooled air conditioners, air/air and water/air heat pumps with electrically driven compressors when used in cooling mode. When these units are used in heating mode by reversing the refrigerating cycle, then EN 255-2 applies.

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 255-2 Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors - Heating mode - Part 2: Testing and requirements for marking for space heating units

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

3 Definitions

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

4 Performance test

4.1 Basic principles

4.1.1 General

All measured parameters, with the exception of time measurement shall be understood to be average values over the duration of the test period.

4.1.2 Cooling capacity

The cooling capacity of the unit is determined by measurements in a calorimeter room or by the air enthalpy method.

The cooling capacity shall be corrected for the heat from the fan:

- If the fan at the evaporator is an integral part of the unit, the heat from this should not affect the cooling capacity greater than the declared value of uncertainty. If the heat is greater, then the same power (calculated in 4.1.4.1) which is excluded from the input is also added to the cooling capacity.

- If the fan at the evaporator is not an integral part of the unit the heat from this should also not affect the cooling capacity greater than the declared value of uncertainty. If the heat is greater, then the same power (calculated in 4.1.4.2) which is included in the input is also subtracted from the cooling capacity.

4.1.3 Power input of fans for units without duct connection

In the case of units which are not designed for duct connection, i.e. which do not permit any external pressure difference, and which are equipped with an integral fan, the power absorbed by the fan shall be included in the effective power absorbed by the unit.

4.1.4 Power input of fans for units with duct connection

4.1.4.1 If a fan is an integral part of the unit, only a fraction of the input of the fan motor shall be included in the effective power absorbed by the unit. The fraction which is to be excluded from the total power absorbed by the unit shall be calculated using the following formula:

$$\frac{q\ \Delta p_e}{\eta} \quad \text{in watts}$$

where:

η is 0,3 by convention;
Δp_e is the available external static pressure difference, in pascals;
q is the nominal air flow rate, in cubic meters per second.

4.1.4.2 If no fan is provided with the unit, the proportional power input which is to be included in the effective power absorbed by the unit, shall be calculated using the following formula:

$$\frac{q\ \Delta p_i}{\eta} \quad \text{in watts}$$

where:

η is 0,3 by convention;
Δp_i is the measured internal static pressure difference, in pascals;
q is the nominal air flow rate, in cubic meters per second.

4.1.5 Power input of water pump

4.1.5.1 If a water pump is an integral part of the unit, only a fraction of the input to the pump motor shall be included in the effective power absorbed by the unit. The fraction which is to be excluded from the total power absorbed by the unit shall be calculated using the following formula:

$$\frac{q\ \Delta p_e}{\eta} \quad \text{in watts}$$

where:

η is 0,3 by convention;
Δp_e is the available external static pressure difference, in pascals;
q is the nominal water flow rate, in cubic meters per second;

4.1.5.2 If no water pump is provided with the unit, the proportional power input which is to be included in the effective power absorbed by the unit, shall be calculated using the following formula:

$$\frac{q\ \Delta p_i}{\eta} \quad \text{in watts}$$

where:

η is 0,3 by convention;
Δp_i is the measured internal static pressure difference, in pascals;
q is the nominal water flow rate, in cubic meters per second.

4.1.5.3 In the case of appliances designed especially to operate on a distributing network of pressurised water without water-pump, no correction is to be applied to the power input.

4.2 Test apparatus

4.2.1 Arrangement of the test apparatus

4.2.1.1 General requirements

The test apparatus shall be designed in such a way that all requirements on adjustment of set values, stability criteria and uncertainties of measurement according to this European Standard can be fulfilled.

Ducted air systems shall be sufficiently air tight to ensure that the measured results are not significantly influenced by exhange of air with the surroundings.

4.2.1.2 Test room for the evaporator

The size of the test room shall be selected such that any resistance to air flow at the air inlet and air outlet orifices of the test object is avoided. The air flow through the room shall not be capable of initiating any short circuit between these two orifices, and therefore the velocity of the air flows through the room at these two locations shall not exceed 1,5 m/s when the test object is switched off. The air velocity in the room shall also not be greater than the mean velocity through the unit inlet. Unless otherwise stated by the manufacturer, the air inlet or air outlet orifices shall be not less than 1 m distant from the surfaces of the test room; this also applies to any measuring ducts.

Any direct heat radiation by heating devices in the test room onto the unit or onto the temperature measuring points shall be avoided.

4.2.1.3 Setting of the external static pressure difference on the air side for appliances with duct connection

For appliances with duct connection, the maximum external static pressure difference available at the nominal flow rate specified by the manufacturer is preferably set on the air outlet side of the unit when the refrigerating system does not operate. The nominal air flow shall then be verified.

4.2.1.4 Setting of the external static pressure difference on the water side for appliances with integral water pumps

For appliances with integral water pumps, the maximum external static pressure difference available at the nominal flow rate specified by the manufacturer is preferably set on the water outlet side of the unit, this also sets the water flows.