ICS 27.080, 91.140.30 SLOVENSKÁ TECHNICKÁ NORMA November 2022

| STN | **Klimatizačné jednotky, jednotky na chladenie kvapalín a tepelné čerpadlá s elektricky poháňanými kompresormi na vykurovanie a chladenie, komerčné a procesné chladenie Skúšanie a hodnotenie pri podmienkach čiastočnej záťaže a výpočet sezónnej účinnosti** | **STN EN 14825**<br><br>14 3003 |
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Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/22

Obsahuje: EN 14825:2022

Oznámením tejto normy sa ruší
STN EN 14825 (14 3003) z júna 2019

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# EUROPEAN STANDARD
# NORME EUROPÉENNE
# EUROPÄISCHE NORM

# EN 14825

July 2022

ICS 27.080; 91.140.30 Supersedes EN 14825:2018

English Version

# Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance

Climatiseurs, groupes refroidisseurs de liquide et pompes à chaleur avec compresseur entraîné par moteur électrique pour le chauffage et le refroidissement des locaux, le froid commercial et industriel - Essais et détermination des caractéristiques à charge partielle et calcul de performance saisonnière

Luftkonditionierer, Flüssigkeitskühlsätze und Wärmepumpen mit elektrisch angetriebenen Verdichtern zur Raumbeheizung und -kühlung - Prüfung und Leistungsbemessung unter Teillastbedingungen und Berechnung der jahreszeitbedingten Leistungszahl

This European Standard was approved by CEN on 24 January 2022.

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 CEN-CENELEC Management Centre or to any CEN member.

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: Rue de la Science 23, B-1040 Brussels**



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# European foreword

This document (EN 14825:2022) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by UNE.

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 January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14825:2018.

The revision was necessary in order to harmonize this European standard with Commission Regulation (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products, with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units and to harmonize this European Standard with Commission Delegated Regulation (EU) No 626/2011 of 4 May 2011 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of air conditioners and Commission's standardization request M/495 and Amendment N° 1, and Commission's standardization request M/560.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, Annex ZB, Annex ZC, Annex ZD, Annex ZE and Annex ZF, which are integral parts of this document.

The main changes with respect to requirements for *forthcoming regulations* are:

a) modification of the title to include commercial cooling and process cooling;

b) modification of Table 4 to include exhaust air dry bulb temperatures;

c) new requirements for hybrid heat pumps in Clause 8;

d) new structure to separate requirements for calculation methods for seasonal space heating efficiency of heat pumps (Clause 7) and requirements for test methods for hybrid heat pumps (Clause 8);

e) update of uncertainties of measurement for the air enthalpy method;

f) removal of Annex E and the void Annex I, and renumbering of the following Annexes;

g) addition a new Annex M about testing and rating of individual indoor units;

h) new informative Annex ZB, Relationship between this European Standard and the requirements of Commission Regulation (EU) No 626/2011 of 4 May 2011; and renumbered the following annexes;

i) new informative Annex ZF, Relationship between this European Standard and the requirements of Commission Regulation (EU) 2016/2281 of 30 November 2016;

j) new numbering of annexes.

| EN 14825:2018 | EN 14825:2022 |
|---|---|
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| Annex F | Annex E |
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Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, 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, Türkiye and the United Kingdom.

# Introduction

Heat pumps, air conditioners and liquid chilling packages can be selected and compared at standard rating conditions. These conditions do not represent the usual operating conditions of the equipment over a season. Better comparison for equipment can be assessed by determining Seasonal Energy Efficiency Ratio, Seasonal Coefficient of Performance and Seasonal Energy Performance Ratio that enable to take into account more representative operating conditions and performance for several part loads.

Fixed capacity heat pumps, air conditioners and liquid chilling packages deal with varying loads by varying the operation time. The efficiency of the system is dependent on the effectiveness of the controlling thermostats. Variable capacity air conditioners, liquid chilling packages and heat pumps, by continuous or step control of the compressor, can more closely match the varying load improving system efficiency.

This document also applies to hybrid units as defined in this standard.

This document provides part load conditions and calculation methods for calculating the Seasonal Energy Efficiency Ratio ($SEER_{on}$), the seasonal energy performance ratio (*SEPR*) and Seasonal Coefficient of Performance ($SCOP_{on}$ and $SCOP_{net}$) of such units when they are used to fulfil the cooling and heating demands.

This document provides methods for calculating the seasonal space cooling energy efficiency $\eta_{s,c}$ and seasonal space heating energy efficiency $\eta_{s,h}$.

Other electric energy consumptions can occur when the unit is not used to fulfil the cooling and heating demands such as those from a crankcase heater or when the unit is on standby. These consumptions are considered in the calculation methods for *SEER* and *SCOP*.

This document also considers Seasonal Energy Performance Ratio of process chillers (*SEPR*) which is representative of variations in loads throughout a complete year. Test conditions and test method are described to calculate this *SEPR*.

*SEER*/$SEER_{on}$, *SCOP*/$SCOP_{on}$, $SCOP_{net}$ and *SEPR* calculations are based on calculated or measured values. In case of measured values, this document gives the methods for testing heat pumps, air conditioners and liquid chilling packages at part load conditions.

The standard rating conditions and test methods are given in EN 14511-2, EN 14511-3 and EN 15879-1.

The standard provides test procedures for the rating of individual indoor units, as part of multi-split systems having a system capacity > 12 kW.

Although this document was prepared in the frame of the Commission Regulation (EU) No 206/2012 of 6 March 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air conditioners and comfort fans, it may also be used to show compliance with the requirements of the European Directive 2010/30/EU and Commission Delegated Regulation (EU) No 626/2011.

This document was prepared in the frame of the Commission Regulation (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters. This European standard also aims at showing compliance with the requirements of the European Directive 2010/30/EU and Commission Delegated Regulation (EU) No 811/2013.

This document was prepared in the frame of the Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers.

This document was prepared in the frame of the Commission Regulation (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products, with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units.

# 1 Scope

This document is applicable to air conditioners, heat pumps and liquid chilling packages, including comfort and process chillers. It applies to factory made units defined in EN 14511-1, except single duct, double duct, control cabinet and close control units. It also covers direct exchange-to-water(brine) heat pumps (DX-to-water(brine)) as defined in EN 15879-1.

This document also applies to hybrid units as defined in this standard.

This document specifies the temperatures, part load conditions and the calculation methods for the determination of seasonal energy efficiency *SEER* and $SEER_{on}$, seasonal space cooling energy efficiency $\eta_{s,c}$, seasonal coefficient of performance *SCOP*, $SCOP_{on}$ and $SCOP_{net}$, seasonal space heating energy efficiency $\eta_{s,h}$ and seasonal energy performance ratio *SEPR*.

Such calculation methods can be based on calculated or measured values.

In case of measured values, this document specifies the test methods for determination of capacities, *EER* and *COP* values during active mode at part load conditions. It also establishes test methods for power input during thermostat-off mode, standby mode, off mode and crankcase heater mode.

NOTE 1 The word “unit” is used instead of the full terms of the products.

NOTE 2 The word “heating” is used to refer to space heating.

# 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 304:2017, *Heating boilers — Test code for heating boilers for atomizing oil burners*

EN 14511-1:2018, *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*

EN 14511-2:2018, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 2: Test conditions*

EN 14511-3:2018, *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 15502-1:2012+A1:2015, *Gas-fired heating boilers — Part 1: General requirements and tests*

EN 15879-1:2011, *Testing and rating of direct exchange ground coupled heat pumps with electrically driven compressors for space heating and/or cooling — Part 1: Direct exchange-to-water heat pumps*