SLOVENSKI STANDARD
SIST EN 327:2002/A1:2004

01-januar-2004

Prenosniki toplote ï Kondenzatorji s prisilno konvekcijo ï Postopki preskuġanja za ugotavljanje tehniļnih karakteristik - Dopolnilo A1

Heat exchangers - Forced convection air cooled refrigerant condensors - Test procedure for establishing performance

Wärmeaustauscher - Ventilatorbelüftete Verflüssiger - Prüfverfahren zur Leistungsfeststellung

Echangeurs thermiques - Condenseurs d'aéroréfrigérant à convection - Procédure d'essai pour la détermination de la perfomance

Ta slovenski standard je istoveten z: **EN 327:2000/A1:2002**

ICS:

27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers

SIST EN 327:2002/A1:2004 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 327:2000/A1

October 2002

ICS 27.060.30

English version

Heat exchangers - Forced convection air cooled refrigerant condensers - Test procedure for establishing performance

Echangeurs thermiques - Aérocondenseurs à convection forcée - Procédure d'essai pour la détermination de la performance

Wärmeaustauscher - Ventilatorbelüftete Verflüssiger - Prüfverfahren zur Leistungsfeststellung

This amendment A1 modifies the European Standard EN 327:2000; it was approved by CEN on 14 September 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This amendment 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

Foreword

This document (EN 327:2000/A1:2002) has been prepared by Technical Committee CEN /TC 110 "Heat exchangers", the secretariat of which is held by BSI.

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 April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This amendment is introduced to accommodate newly available refrigerants such as R404A, R407C and R410A.

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

Title

English title to read:

Heat exchangers – Forced convection air cooled refrigerant condensers – Test procedure for establishing performance

3 Definitions

Insert the following definition after 3.5.2.5:

3.5.2.6 bubble point temperature: Temperature corresponding to the absolute pressure of the refrigerant at the outlet connection of the condenser.

Definition 3.6.3 revised to read:

3.6.3 subcooling: Difference between the bubble point temperature and the subcooled refrigerant temperature.

Insert the following definition after 3.6.3:

3.7 high glide*:* Refrigerant where the difference between the condensing and bubble point temperatures at a condensing temperature of 40°C is greater than 3K.

Amend the sub-clause numbers as follows [the content of these clauses is to be retained]:

3.8 fan power:

3.9 nominal fan power:

3.10 nominal air flow:

3.11 internal volume:

3.12 fouling resistance:

3.13 oil content:

5 Standard capacity

5.2 Standard capacity conditions

Replace sub-clause 5.2 as follows:

The standard capacity shall be based on tests performed on a clean and dry condenser under the following operating conditions.

t_{A1} 25°C

Δt_1 15K

$\Delta t_{sub} \leq 3$K

nominal voltage and frequency

Δt_{sup} for common refrigerants shall be determined according to:

R134a	25K	NH_3	50K
		R404A	25K
		R407C	35K
		R410A	40K

Table 1 – Uncertainty of measurements

Add to table:

Measurements	Uncertainty of measurements
Refrigerant mixture	± 1 % by mass for each refrigerant component

7 Measurements

7.2 Measurement criteria

Add further sub-clause 7.2.6:

7.2.6 Non-azeotropic refrigerant

For high glide refrigerants the refrigerant mixture shall be measured unless it can be guaranteed that the mass fraction varies by less than 2 % from the refrigerant manufacturer's data.

8 Testing methods and equipment

8.1 Testing methods for capacity

Add note to 8.1.2 as follows:

NOTE This method is not suitable for high glide refrigerants

8.3 Equipment for capacity measurement

Delete third paragraph of 8.3.2 to read as follows:

8.3.2 *High pressure calorimeter*

The calorimeter consists of a well-insulated pressure vessel inside which the refrigerant is evaporated and superheated in a consecutive superheating zone. The heat may be supplied directly or indirectly via a secondary fluid.

When the heating elements are in direct contact with the refrigerant, their temperature shall be low enough to prevent decomposition of the refrigerant.

When the heat is supplied indirectly, the heating elements are immersed into a secondary fluid surrounding an evaporator coil. The secondary fluid is heated up approximately to the superheating temperature. It consists preferably of a volatile liquid and the evaporator coil is placed in the vapour zone of the vessel. The refrigerant itself is evaporated and superheated in the evaporator coil.

NOTE 1 The coil needs to be sized only for maximum requirements and can be used also for lower capacities.

When calculating the total heat content of the calorimeter, the mass of the secondary fluid and the refrigerant in the calorimeter vessel shall be considered.

When a circulation pump is used, it shall not induce measurable heat into the refrigerant.

NOTE 2 The heat induced by the pump is a variable which can only be verified with great difficulty in the calibration test. Furthermore it mostly causes flashgas which falsifies the measured value of the flow meter and influences the performance of the pump itself adversely.

NOTE 3 This normally requires a variable speed pump, thermally separated from the refrigerant cycle. A throttling device for flow control causes flashgas in the pump and the flow meter. The circulation pump should be placed between the liquid receiver and the flow meter in order to obtain maximum subcooling in the meter. A short equalising line between the pump and the meter can be useful.

If no flashgas is present the heat input by the pump should be negligible.

Add further sub-clause 8.3.6:

8.3.6 Liquid receiver

For high glide refrigerants the internal volume of the liquid receiver shall be less than 4 % of the total system volume.