SLOVENSKI STANDARD
SIST EN 50563:2012

01-januar-2012

Samostojne (zunanje) usmerniške (AC-DC) in transformatorske (AC-AC) naprave - Ugotavljanje moči brez obremenitve in povprečnega izkoristka aktivnih načinov

External a.c. - d.c. and a.c. - a.c. power supplies - Determination of no-load power and average efficiency of active modes

Externe AC/DC- und AC/AC-Netzteile - Bestimmung von Nulllast und durchschnittlicher Effizienz im Betrieb

Sources d'alimentation externes en courant alternatif et en courant continu - Détermination de la consommation hors charge et du rendement moyen en mode actif

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External a.c. - d.c. and a.c. - a.c. power supplies – Determination of no-load power and average efficiency of active modes

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Contents

Figure

Tables

Foreword

This document (EN 50563:2011) has been prepared by the Technical Committee CENELEC TC 108X, Safety of electronic equipment within the fields of audio/video, information technology and communication technology and the Technical Committee CENELEC TC 59X, Performance of household and similar electrical appliances.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-10-10
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Introduction

This European Standard was written in response to an EC mandate requesting the creation of a harmonised standard providing a reliable, accurate and reproducible method of measuring the no-load power consumption and determining the average efficiency of active modes for external power supplies, which takes into account the generally recognised state of the art measurement methods.

This standard makes extensive reference to EN 50564 *Electrical and electronic household and office equipment - Measurement of low power consumption,* which was also prepared under an EC mandate to support the ecodesign Directive. Other provisions are based on the test method published by the EPA and the Australian/NZ Standard AS/NZS 4665.1.

The methods defined in this standard are intended to cover no-load power consumption and average efficiency of active modes for a.c. - a.c. and a.c. – d.c. external power supplies.

The aim is to ensure this European Standard is compatible with the objectives of EU legislation for ecodesign. This standard is applicable to a wider range of products than EC Regulation No 278/2009.

1 Scope

This European Standard specifies methods of measurement of electrical power consumption, and the reporting of results, for external power supplies. This standard is applicable to external power supplies with a rated input voltage within the range 100 V a.c. to 250 V a.c. having a single output with a rated output power not exceeding 250 W and a rated output voltage not exceeding 230 V a.c. or 325 V d.c. The output voltage may be either at a fixed voltage, or at a voltage which is user selectable, or at a voltage that is automatically selectable by the external power supply so as to be compatible with one or more product-loads.

NOTE 1 This document has been written in particular to support EC Regulation No 278/2009 for the measurement of no-load condition electric power and average efficiency of active modes for external power supplies.

NOTE 2 This standard does not specify safety requirements for products nor safety precautions to be taken by those performing measurements. It does not specify minimum performance requirements, nor does it set maximum limits on power or energy consumption.

2 Normative references

The following referenced documents are indispensable for the application 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 50564:2011, *Electrical and electronic household and office equipment – Measurement of low power consumption (IEC 62301:2011, modified)*

IEC 60050-131:2002, *International Electrotechnical Vocabulary – Part 131: Circuit theory*

IEC 60050-300:2001, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-131:2002 and IEC 60050-300:2001 and the following apply.

Throughout this standard the term “power” is used to refer to “active power” unless otherwise specifically stated

3.1 Equipment related definitions

3.1.1
external power supply

void

NOTE 1 Refer to relevant legislation.

NOTE 2 EC Regulation 278/2009 defines External Power Supply as follows:

‘external power supply’ means a device which meets all of the following criteria:

a) it is designed to convert alternating current (AC) power input from the mains power source input into lower voltage direct current (DC) or AC output;

b) it is able to convert to only one DC or AC output voltage at a time;

c) it is intended to be used with a separate device that constitutes the primary load;

d) it is contained in a physical enclosure separate from the device that constitutes the primary load;

e) it is connected to the device that constitutes the primary load via a removable or hard-wired male/-female electrical connection, cable, cord or other wiring;

f) it has nameplate output power not exceeding 250 Watts;

g) *it is intended for use with electrical and electronic household and office equipment as referred to in Article 2(1) of Regulation (EC) No 1275/2008.*

3.1.2
rated input frequency

a.c. input frequency of the external power supply, as specified by the manufacturer

3.1.3
rated input voltage

a.c. input voltage of the external power supply, as specified by the manufacturer

3.1.4
rated output current

output current of the external power supply, as specified by the manufacturer

NOTE In EC Regulation 278/2009 the corresponding term is “nameplate output current”.

3.1.5
rated output power

output power of the external power supply, as specified by the manufacturer

NOTE In EC Regulation 278/2009 the corresponding term is “nameplate output power” (Po).

3.1.6
rated output voltage

output voltage of the external power supply, as specified by the manufacturer

NOTE In EC Regulation 278/2009 the corresponding term is “nameplate output voltage”.

3.2 Measurement related definitions

3.2.1
active mode

void

NOTE 1 Refer to relevant legislation.

NOTE 2 EC Regulation 278/2009 defines active mode as follows:

'active mode' means a condition in which the input of an external power supply is connected to the mains power source and the output is connected to a load.

3.2.2
active mode efficiency

void

NOTE 1 Refer to relevant legislation.

NOTE 2 EC Regulation 278/2009 defines Active mode efficiency as follows:

'active mode efficiency' means the ratio of the power produced by an external power supply in active mode to the input power required to produce it.

NOTE 3 The active mode efficiency is likely to depend upon the output power.

3.2.3
active power (*P*)

under periodic conditions, mean value, taken over one period T, of the instantaneous power *P*:

$$P = \frac{1}{T}\int_0^T p\,dt$$

NOTE 1 Under sinusoidal conditions, the active power is the real part of the complex power.

NOTE 2 The SI unit for active power is the watt.

[IEC 60050, definition 131-11-42]

3.2.4
apparent power (*S*)

product of the r.m.s. voltage *U* between the terminals of a two-terminal element or two-terminal circuit and the r.m.s electric current *I* in the element or circuit:

$S = UI$

NOTE 1 Under sinusoidal conditions, the apparent power is the modulus of the complex power.

NOTE 2 The SI unit for apparent power is the voltampere.

[IEC 60050, definition 131-11-41]

3.2.5
average efficiency of active modes
average of the active mode efficiencies at 25 %, 50 %, 75 % and 100 % of the rated output current

NOTE In EC Regulation 278/2009 the corresponding term is "average active efficiency".

3.3
no-load condition
void

NOTE 1 Refer to relevant legislation.

NOTE 2 EC Regulation 278/2009 defines No load condition as follows:

'no-load condition' means the condition in which the input of an external power supply is connected to the mains power source, but the output is not connected to any primary load.

3.4
power factor
ratio of the active power to the apparent power

NOTE The definition of power factor includes the effect of both distortion and displacement of the current waveform relative to the voltage waveform.

3.5
total harmonic distortion (*THD*)
ratio of the r.m.s. value of the harmonic content of an alternating quantity to the r.m.s. value of the fundamental component of the quantity

[IEC 60050, definition 551-17-06]