



Fastställd 2016-04-13

Utgåva **1**  Sida 1 (1+42) Ansvarig kommitté

**SEK TK 100** 

© Copyright SEK. Reproduction in any form without permission is prohibited.

Audio- och videoutrustning – Mätning av elförbrukning – Del 3: TV-mottagare

Audio, video, and related equipment – Determination of power consumption –

Part 3: Television sets

Som svensk standard gäller europastandarden EN 62087-3:2016. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62087-3:2016.

### Nationellt förord

Europastandarden EN 62087-3:2016

består av:

- europastandardens ikraftsättningsdokument, utarbetat inom CENELEC
- IEC 62087-3, First edition, 2015 Audio, video, and related equipment Determination of power consumption - Part 3: Television sets

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ersätter delvis tidigare fastställd svensk standard SS-EN 62087, utgåva 3, 2014, som ej gäller fr o m 2019-02-19.

ICS 33.160.10

#### Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

#### Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

#### Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284 164 29 Kista Tel 08-444 14 00 www.elstandard.se

### EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

### EN 62087-3

February 2016

ICS 33.160.10

Supersedes EN 62087:2012 (partially)

#### **English Version**

# Audio, video, and related equipment - Determination of power consumption - Part 3: Television sets (IEC 62087-3:2015)

Appareils audio, vidéo et matériel connexe - Détermination de la consommation de puissance - Partie 3: Téléviseurs (IEC 62087-3:2015)

Messverfahren für die Leistungsaufnahme von Audio-, Video- und verwandten Geräten - Teil 3: Fernsehgeräte (IEC 62087-3:2015)

This European Standard was approved by CENELEC on 2015-07-10. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

### **European foreword**

The text of document 100/2468/FDIS, future edition 1 of IEC 62087-3, prepared by Technical Area 12 "AV energy efficiency and smart grid applications" of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62087-3:2016.

The following dates are fixed:

•	latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-08-19
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-02-19

This document supersedes EN 62087:2012 (partially).

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

### **Endorsement notice**

The text of the International Standard IEC 62087-3:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62087:2008	NOTE	Harmonized as EN 62087-2:2009 1) (not modified).
IEC 62087:2011	NOTE	Harmonized as EN 62087-2:2012 (not modified).
IEC 62087 Series	NOTE	Harmonized as EN 62087 Series.
IEC 62087-4	NOTE	Harmonized as EN 62087-4.
IEC 62087-5	NOTE	Harmonized as EN 62087-5.
IEC 62087-6	NOTE	Harmonized as EN 62087-6.
IEC 62542:2013	NOTE	Harmonized as EN 62542:2013 (not modified).

-

<sup>&</sup>lt;sup>1)</sup> Superseded by EN 62087-2:2012 (IEC 62087:2011).

# Annex ZA (normative)

# Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 62087-1	2015	Audio, video, and related equipment - Determination of power consumption - Part 1: General	EN 62087-1	2016
IEC 62087-2	2015	Audio, video, and related equipment - Determination of power consumption - Part 2: Signals and media	EN 62087-2	2016
IEC 62301 (mod)	2011	Household electrical appliances - Measurement of standby power	EN 50564	2011

### CONTENTS

F	DREWO	RD	4
IN	TRODU	CTION	6
1	Scop	e	7
2	Norm	ative references	7
3	Term	s, definitions, and abbreviations	7
	3.1	Terms and definitions	7
	3.2	Abbreviations	
4	Spec	ification of operating modes and functions	
	4.1	Table of operating modes and functions	
	4.2	Configurations and picture settings	
	4.2.1	Conceptual framework	
	4.2.2	·	
	4.2.3	_	
5	Meas	urement conditions	
	5.1	General	. 13
	5.2	Power source	
	5.3	Environmental conditions	.13
	5.4	Ambient light conditions	. 13
	5.5	Measuring equipment	. 13
	5.5.1	Power measuring instrument	. 13
	5.5.2	Luminance measuring device	. 13
	5.5.3	Illuminance measuring instrument	. 13
	5.6	Signal generation	. 13
	5.6.1	Equipment	. 13
	5.6.2	Interfaces	. 13
	5.6.3	Accuracy	. 13
	5.6.4	Light source for specific illuminance levels	
	5.6.5	3	
	5.6.6	Networking equipment	
6	Proce	edures	. 15
	6.1	Order of activities	. 15
	6.2	Preparation	. 15
	6.2.1	Measuring plan	
	6.2.2		
	6.2.3	•	
	6.2.4	Video signal, On mode power consumption procedure	
	6.2.5	Video signal, peak luminance ratio determination	
	6.2.6		
	6.2.7	5	
	6.2.8	S .	
	6.2.9	•	
	6.3	Initial activities	
	6.3.1	Order of initial activities	
	6.3.2		
	6.3.3	Main batteries	
	6.3.4	Plug-in module	. 19

6.3.5	Installation	19
6.3.6	Application of input signals	20
6.3.7	Luminance measuring device setup	20
6.3.8	Light source setup	20
6.3.9	Power on	21
6.3.10	TV settings	21
6.4 Det	ermination of power consumption, On mode	22
6.4.1	Order of activities	22
6.4.2	Stabilization	23
6.4.3	Television sets without automatic brightness control enabled by default	24
6.4.4	Television sets with automatic brightness control enabled by default	24
6.4.5	Power measurement	24
6.5 Det	ermination of peak luminance ratio and power factor	26
6.5.1	General	26
6.5.2	Activities for peak luminance ratio and power factor determination	26
6.6 Det	ermination of power consumption, Partial On mode	
6.6.1	General	28
6.6.2	Order of activities	29
6.6.3	AV inputs	
6.6.4	Standby-passive	29
6.6.5	Standby-active, low	29
6.7 Det	ermination of power consumption, Off mode	30
6.7.1	Connections and networking	30
6.7.2	Availability	31
6.7.3	Measurement	
Annex A (info	mative) Considerations for On mode television set power measurements	32
A.1 Ger	neral	32
A.2 Illur	minance levels for automatic brightness control	32
A.3 We	ghting of automatic brightness control levels	32
A.4 Cal	culating On mode power consumption	33
A.5 Pict	ure level adjustments	34
Annex B (norr	native) Test report	35
Annex C (info	rmative) Example test report template	37
Bibliography		40
Figure 1 – Co	nfigurations and picture settings, conceptual framework	12
Figure 2 – Re	commended order of activities	15
Figure 3 – Ord	der of initial activities	19
	ht source configuration	
	der of activities for determining power consumption, On mode	
_	- '	
•	der of activities for determining peak luminance ratio and power factor	
Figure 7 – Ord	der of activities for determining the power consumption, Partial On mode	29
Table 1 – Ope	rating modes and functions	11

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

### AUDIO, VIDEO, AND RELATED EQUIPMENT – DETERMINATION OF POWER CONSUMPTION –

### Part 3: Television sets

#### **FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62087-3 has been prepared by technical area 12: AV energy efficiency and smart grid applications, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This first edition of IEC 62087-3 cancels and replaces Clauses 6 and 11 and Annex B of IEC 62087:2011. This standard together with IEC 62087-1 to IEC 62087-2 and IEC 62087-4 to IEC 62087-6 cancels and replaces IEC 62087:2011 in its entirety. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to Clauses 6 and 11 and Annex B of IEC 62087:2011.

- For TVs with an automatic brightness control feature, power may now be measured at multiple specific illumination levels.
- A method has been defined for determining the ratio of peak luminance expected in the home versus the peak luminance expected in the retail environment.

- Sections related to general measuring conditions and procedures are now in IEC 62087-1:2015.
- Sections related to signals and media are now in IEC 62087-2:2015.
- The titles have changed in order to comply with the current directives and to accommodate the multipart structure.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/2468/FDIS	100/2498/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

A list of all parts in the IEC 62087 series, published under the general title *Audio, video, and related equipment – Determination of power consumption*, can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- · replaced by a revised edition, or
- · amended.

A bilingual version of this publication may be issued at a later date.

### INTRODUCTION

This standard specifies the determination of the power consumption of television sets for consumer use. It is used in conjunction with IEC 62087-2:2015, which specifies signals and media.

This standard includes measuring procedures for the determination of power consumption in the On (operation) mode, which was identified as "On (average) mode" in previous editions of IEC 62087. Additionally, it specifies measuring procedures for the determination of power consumption in the Off mode and Partial On mode. This standard also defines the determination of the peak luminance ratio for use associated with television set power consumption evaluation as well as the power factor.

A verification procedure to assess product compliance is described in Annex A of IEC 62087-1:2015.

IEC 62087 has been subdivided and currently consists of the following planned or published parts:

- Part 1: General
- Part 2: Signals and media
- Part 3: Television sets
- Part 4: Video recording equipment
- Part 5: Set top boxes
- Part 6: Audio equipment

### AUDIO, VIDEO, AND RELATED EQUIPMENT – DETERMINATION OF POWER CONSUMPTION –

Part 3: Television sets

### 1 Scope

This part of IEC 62087 specifies the determination of the power consumption and related characteristics of television sets. Television sets include, but are not limited to, those with CRT, LCD, PDP, OLED, or projection technologies.

The operating modes and functions, as they specifically apply to television sets, are defined in detail in this part of IEC 62087.

This standard is limited to television sets that can be connected to an external power source. Television sets that include a non-removable, main battery are not covered by this standard. Television sets may include any number of auxiliary batteries.

The measuring conditions in this standard represent the normal use of the equipment and may differ from specific conditions, for example as specified in safety standards.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62087-1:2015, Audio, video, and related equipment – Determination of power consumption – Part 1: General

IEC 62087-2:2015, Audio, video, and related equipment – Determination of power consumption – Part 2: Signals and media

IEC 62301:2011, Household electrical appliances – Measurement of standby power