IEC 63103

Edition 1.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Lighting equipment – Non-active mode power measurement

Appareils d'éclairage – Mesure de puissance en mode non actif

IEC 63103:2020-07(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, …). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC 63103

Edition 1.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Lighting equipment – Non-active mode power measurement

Appareils d'éclairage – Mesure de puissance en mode non actif

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.140.01; 29.140.99

ISBN 978-2-8322-9996-8

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

LIGHTING EQUIPMENT – NON-ACTIVE MODE POWER MEASUREMENT

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 63103 has been prepared by IEC technical committee 34: Lamps and related equipment.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
34/698/FDIS	34/709/RVD

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

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

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The first edition of this document specifies uniform requirements for measuring non-active mode power consumption for all lighting equipment. Present performance standards for controlgear (IEC 62442 (all parts)) and luminaires (IEC 62722-1), already include some descriptions for measuring standby power. It is expected that these standards will be amended, accordingly.

In addition to an illumination function, today's lighting equipment can execute a variety of additional non-illumination functions, for example through integrated surveillance cameras, noise detectors, occupancy counters, vehicular and pedestrian traffic detection, weather detection, smoke detection, visible light communication and proximity or location devices. During the execution of these functions, the (multi-function) lighting equipment can operate in many different (active and non-active) modes. Non-active mode power consumption of (multi-function) lighting equipment, i.e. the power consumed when the illumination function is off, is an important aspect of lighting equipment and is becoming more important with the emergence of connected lighting.

This document defines and describes methods of measurement of electrical power consumption in non-active mode(s) for lighting equipment. The document is organized into two main clauses: Clause 4 "General test conditions" and Clause 5 "Measurements".

Clause 4 contains specifications on the general conditions for making the measurements. Subclauses 4.1 through 4.4 cover conditions for setting up the laboratory, selecting a supply voltage and suitable instruments for the power measurement. Subclause 4.5 covers aspects which should be considered when the lighting equipment is connected to a network to work properly. Subclause 4.5.2 is for wired networks and 4.5.3 and 4.5.4 give setups for wireless networks using conducted or radiated connections, respectively. These setups for wireless networks are harmonized with ETSI Standard EN 300 328 and modified for lighting equipment.

Clause 5 details the procedures for making measurements of the equipment under test (EUT). Subclause 5.1 gives general instructions for setting the EUT into the possible non-active mode(s). Subclause 5.2 details the large variety of EUTs. These EUTs can be placed into two categories: illumination-only (5.2.2) and multi-function (5.2.3) lighting equipment. Traditional lighting equipment with an illumination-only function is summarized in 5.2.2, Table 1. Multi-function lighting equipment having additional non-illumination functions is addressed in 5.2.3. A standardized form for reporting the measured result according to the functions and modes of the multi-function lighting equipment under test is specified in 5.2.3, Table 2. Table 2 is a central feature of this document that will enable all users to report their non-active power results in a consistent manner.

Subclause 5.3 specifies procedures for preparing the EUT to make measurements of the input power. Instructions for EUTs containing battery charging functions are found in 5.3.2. Subclause 5.3.3 gives procedures for EUTs having no network provision and 5.3.4 covers networked EUTs whether wired or wireless.

The measurement procedure is specified in 5.4 and offers three alternative methods and the specific stability conditions required for each. These methods are adapted for lighting equipment from IEC 62301:2011. The direct meter method specified in 5.4.2 has the most limited applicability. It can only be used when the power reading is stable. In cases of discrepancy, the average reading method (5.4.3) or sampling method (5.4.4) have precedence. The average reading method is suitable only for EUTs having stable modes whereas the sampling method is suited for cyclic or unstable modes and if the mode is of limited duration.

Informative annexes are included to illustrate various measurement setups (Annex B and Annex C) and Annex D provides practical examples of controlgear, for example involving lighting equipment having a digital addressable lighting interface network in accordance with IEC 62386 (all parts), and of luminaires.

The methods defined and described in this document are not intended to be used to measure power consumption of (multi-function) lighting equipment during active mode(s) (also called "on mode(s)"), as these are generally covered by IEC standards or other product standards.

This document provides methods of measurement for lighting equipment. However, the methods specified in this document could also be used to measure lighting system models. A system model is a full-size portion of the lighting system containing specific functions and can set every mode of a portion of the system. The system models should be scalable to the entire lighting system additively. Thus, the total non-active mode power consumption of the system should equal the summation of power measured in each system model.

Using an adaptive roadway and pedestrian lighting system as an example for illustration, the following three system models could be present:

– (A) five luminaires connected to one daylight sensor; illuminate to compensate daylight;
– (B) a luminaire with a pedestrian sensor, a daylight sensor, connected to a crosswalk illumination; illuminate the crosswalk upon sensing a pedestrian when needed;
– (C) a dimmable luminaire with a vehicle detector; illuminate upon sensing a vehicle when needed.

Assume the lighting system comprises 50 A-, 10 B-, and 20 C-system models, then the total power consumption for a specified mode of the system would be Power(mode) = 50 × power(A) + 10 × power(B) + 20 × power(C). Table 2 (5.2.3) could be used to specify the measurement of a system model set in various combinations of modes. In this way, the system is evaluated in measurable pieces (system models) set to function interactively as the entire system is intended for each mode.

LIGHTING EQUIPMENT – NON-ACTIVE MODE POWER MEASUREMENT

1 Scope

This document specifies methods of measurement of electrical power consumption in non-active mode(s), as applicable for electrical lighting equipment. This includes electrical lighting equipment incorporating non-illumination components.

This document specifies neither performance requirements nor limits on power consumption.

This document applies to lighting equipment connected to a supply voltage up to 1 500 V DC or up to 1 000 V AC.

This document is intended to be referenced by lighting equipment product standards for the measurement of non-active mode power consumption. Details for the non-active mode power consumption measurement and data presentation are specified in the product standards.

NOTE Annex A provides guidance on details specified in product standards.

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.

IEC 60050-845, *International Electrotechnical Vocabulary – Part 845: Lighting (available at http://www.electropedia.org)*

IEC 62504, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions*

IEC TS 63105*, Lighting systems and related equipment – Vocabulary*[1]

ETSI EN 300 328 V2.1.1 (2016-11), *Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 60050-845, IEC 62504 and IEC TS 63105 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

_____

1 Under preparation. Stage at the time of publication IEC CDTS 63105:2020.