# IEC 62442-2

Edition 3.0 2022-02
REDLINE VERSION

# INTERNATIONAL STANDARD



colour inside

**Energy performance of lamp controlgear –**
**Part 2: Controlgear for ~~high intensity~~ discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear**

IEC 62442-2:2022-02 RLV(en)

IEC Secretariat
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 It also gives information on projects, replaced and withdrawn publications.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 Products & Services Portal - products.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 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

# IEC 62442-2

Edition 3.0 2022-02
REDLINE VERSION

# INTERNATIONAL STANDARD

colour inside



## Energy performance of lamp controlgear – Part 2: Controlgear for ~~high intensity~~ discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 29.140.99

ISBN 978-2-8322-1081-0

# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

# ENERGY PERFORMANCE OF LAMP CONTROLGEAR –

# Part 2: Controlgear for ~~high intensity~~ discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear

## 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.

**This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62442-2:2018. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

IEC 62442-2 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lighting. It is an International Standard.

This third edition cancels and replaces the second edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the title of Part 2 has been modified;
b) this edition has been harmonized with IEC 62442-1 and IEC 62442-3;
c) the reference to and use of the measurement methods for non-active power consumption in accordance with IEC 63103 have been added.

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

| Draft | Report on voting |
|---|---|
| 34C/1546/FDIS | 34C/1549/RVD |

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62442 series, published under the general title *Energy performance of lamp controlgear*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.**

# ENERGY PERFORMANCE OF LAMP CONTROLGEAR –

# Part 2: Controlgear for ~~high intensity~~ discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear

## 1 Scope

This part of IEC 62442 defines a measurement method of the power losses of electromagnetic controlgear, the total input power and the standby power of electronic controlgear for ~~high intensity discharged~~ discharge lamps (excluding low-pressure mercury fluorescent lamps). A calculation method of the efficiency of controlgear for ~~high intensity discharged~~ discharge lamp(s) is also defined.

It is assumed that the controlgear are designed for use on DC supplies up to 1 000 V and/or AC supplies up to 1 000 V at 50 Hz or 60 Hz.

This document applies to electrical controlgear-lamp circuits comprised solely of the controlgear and of the lamp(s).

NOTE Requirements for testing individual controlgear during production are not included.

This document specifies the measurement method for the total input power, the standby power and the calculation method of the lamp controlgear efficiency for all controlgear sold for domestic and normal commercial purposes operating with ~~high intensity~~ discharge lamps.

This document does not apply to:

– controlgear which form an integral part of lamps;
– controlgear circuits with capacitors connected in series;
– controllable electromagnetic controlgear.

## 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 (IEV) – Part 845: Lighting* (available at http://www.electropedia.org)

IEC 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*

~~IEC 61347-2-9, *Lamp controlgear – Part 2-9: Particular requirements for electromagnetic controlgear for discharge lamps (excluding fluorescent lamps)*~~

~~IEC 61347-2-12, *Lamp controlgear – Part 2-12: Particular requirements for d.c. or a.c. supplied electronic ballasts for discharge lamps (excluding fluorescent lamps)*~~

IEC 63103:2020, *Lighting equipment – Non-active mode power measurement*

IEC TS 63105:2021, *Lighting systems and related equipment – Vocabulary*

IEC Guide 115:~~2007~~2021, *Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845 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

**3.1**
**nominal value**
suitable approximate quantity value used to designate or identify a component, device or equipment

Note 1 to entry: To express the "nominal value" of a particular quantity, the term "value" is replaced by the quantity name; for example, nominal power, nominal voltage, and nominal current.

[SOURCE: IEC 62442-1:~~2018~~2022, 3.1]

**3.2**
**rated value**
~~quantity value for specified operating conditions of a component, device or equipment~~

~~Note 1 to entry: The value and conditions are specified in the relevant standard or assigned by the manufacturer or responsible vendor.~~

~~[SOURCE: IEC 62442-1:2018, 3.3, modified — Note 2 has been deleted.]~~

value of a quantity, used for specification purposes, declared by the manufacturer or responsible vendor and established under standard test conditions

Note 1 to entry: To express the "rated value" of a particular quantity, the term "value" is replaced by the quantity name; for example, rated power, rated voltage, rated current, and rated temperature.

[SOURCE: IEC 60050-845:2020, 845-27-100, modified – Note 2 to entry has been deleted.]

**3.3**
**controlgear**
one or more components between the supply and one or more lamps which ~~may~~ can serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference

[SOURCE: IEC 62442-1:~~2018~~2022, 3.~~4~~3]

**3.4**
**electromagnetic controlgear**
**magnetic controlgear**
controlgear which by means of inductance, or a combination of inductance and capacitance, serves mainly to limit the current of the electric lamp(s) ~~to the required value and operates the lamp(s) at the same frequency as the supply frequency~~

[SOURCE: ~~IEC 62442-1:2018, 3.5~~ IEC 60050-845:2020, 845-28-052, modified – The second preferred term has been added.]

**3.5**
**electronic controlgear**
~~<high intensity discharge lamps>~~ <of discharge lamp> AC and/or DC supplied electronic circuit including stabilizing elements for starting and operating one or more lamp(s)

**3.6**
**discharge lamp**
lamp in which the light is produced, directly or indirectly, by an electric discharge through a gas, a metal vapour or a mixture of several gases and vapours

**3.7**
**controlgear-lamp circuit**
electrical circuit, or part thereof, normally built in a luminaire, consisting of the controlgear and lamp(s)

[SOURCE: IEC 62442-1:~~2018~~2022, 3.~~8~~7]

**3.8**
**standby mode**
~~mode of the controlgear, in which the light source is switched off by a control signal, while the controlgear remains connected to the mains supply~~

<of controlgear> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger not being a trigger from a network

Note 1 to entry: Examples of external triggers are sensing or timing.

[SOURCE: IEC 63103:2020, 3.10, modified – The domain "<of lighting equipment>" has been replaced with "<of controlgear>".]

**3.9**
**networked standby mode**
<of controlgear> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger being a trigger from a network

[SOURCE: IEC 63103:2020, 3.11, modified – The domain "<of lighting equipment>" has been replaced with "<of controlgear>".]

**3.10**
**standby power**
<of controlgear> average power consumption in the standby mode

~~Note 1 to entry: Power supplied by controlgear to sensors, network connections and other auxiliaries is not include in the standby power.~~

~~Note 2 to entry: Standby power is expressed in W.~~

**3.11**
**networked standby power**
<of controlgear> average power consumption in the networked standby mode

**3.12**
**total input power**
total power consumed by the ~~controlgear-lamp (light source)~~ controlgear-light source circuit measured at rated input voltage

~~[SOURCE: IEC 62442-1:2018, 3.13, modified — "supplied to" has been replaced with "consumed by", "(light source)" has been added and the note has been deleted.]~~

**3.13**
~~**efficiency of lamp controlgear**~~
~~$\eta_{MCG}$~~
~~$\eta_{ECG}$~~
~~<high intensity discharge lamps> ratio of the output power to lamp(s) and input power of the controlgear~~

~~Note 1 to entry: Detailed measurement methods and conditions are given in Clause 5.~~

~~Note 2 to entry: Loads from sensors, network connections or other auxiliaries are disconnected or, if not possible, otherwise eliminated from the result.~~

**controlgear efficiency**
$\eta_{CG}$
ratio of the output power to the lamp(s) and the input power of the controlgear

Note 1 to entry: Loads from sensors, network connections or other auxiliaries are disconnected or, if not possible, otherwise eliminated from the result.

**3.14**
**multi-lamp type controlgear**
single-lamp controlgear designed for the operation of more than one type of lamp with different electrical characteristics, for example power

**3.15**
**controllable controlgear**
controlgear whose light sources operating characteristics can be changed by means of a signal via mains or control input(s)

Note 1 to entry: Signal control is either wired or wireless.

## 4 General

~~**4.1 Applicability**~~

~~The measurement and calculation methods in this document shall only be used for lamp controlgear which conforms to IEC 61347-2-9 or IEC 61347-2-12.~~

### 4.1 General notes on tests

The measurement conditions specified in IEC 61347-1:2015, Clauses H.1, H.2, H.4, H.8, H.9 and H.11 shall be applied unless otherwise specified in this document. The device under test (DUT) shall be placed according to IEC 61347-1:2015, Figure H.1.

An AC or DC voltage source shall be used to provide input voltage to the DUT. During the tests, the supply voltage and the frequency shall be maintained constant within ±0,5 % during the warm-up period. However, during the actual measurement, the voltage shall be adjusted to within ±0,2 % of the specified testing value.

Unless otherwise specified in IEC 63103, stability of the measurement values (V, A or W) is given if the data does not deviate by more than 1 % in a time frame of 15 min. If any of these

values vary with time, the power is determined as the arithmetic mean value over a sufficient period.

### 4.2 Controllable controlgear

In the case of controllable controlgear, the test shall be carried out with the maximum output power.

Requirements for other than 100 % light output operation of controllable controlgear and multi-tapped electromagnetic controlgear are under consideration.

### 4.3 Multi-lamp type controlgear

If a single-lamp controlgear is designed for different lamp powers then the test shall be carried out for each lamp.

The test for multi-lamp controlgear shall be carried out with all possible combinations.

### 4.4 Measurement uncertainty

Measurement uncertainty shall be managed in accordance with the accuracy method in IEC Guide 115:~~2007~~2021, 4.4.3.

### 4.5 Sampling of controlgear for testing

The requirements and tolerances specified in this document are based on the testing of a type test sample submitted by the manufacturer for that purpose. This sample should consist of units having characteristics typical of the manufacturer's production and be as close to the production centre point values as possible.

### 4.6 Size of the test sample

Tests are carried out with one test specimen.

### 4.7 Power supply

Where the test voltage and frequency are not defined by national or regional requirements, the controlgear manufacturer shall declare the nominal voltage(s) at which the given efficiency is valid.

Test voltage(s) and test frequency(ies) shall be the nominal voltage and the nominal frequency of the country or region for which the measurement is being determined (refer to Table 1).

**Table 1 – Typical nominal electricity supply details for some regions**

| Country or region | Nominal voltage and frequency [a] |
|---|---|
| Europe | 230 V; 50 Hz |
| North America | 120 V, 277 V; 60 Hz |
| Japan [b] | 100 V, 200 V; 50/60 Hz |
| China | 220 V; 50 Hz |
| Australia and New Zealand | 230 V; 50 Hz |
| South Africa | 230 V, 50 Hz |

[a] Values are for single phase only. Some single phase supply voltages can be double the nominal voltage above (centre transformer tap). The voltage between two phases of a three-phase system is 1,73 times single phase values (e.g. 400 V for Europe).

[b] 50 Hz is applicable for the Eastern part and 60 Hz for the Western part.

The above table can require test voltages additional to those required in IEC 63103.

### 4.8 Supply voltage waveform

The total harmonic content of the supply voltage when supplying the DUT shall not exceed 3 %; harmonic content is defined as the root-mean-square (RMS) summation of the individual components using the fundamental as 100 %.

The ratio of peak value to RMS value of the test voltage (i.e. crest factor) shall be between 1,34 and 1,49.

### 4.9 Instrument accuracy

For measurement uncertainty and traceability see ISO/IEC Guide 98-3 and IEC Guide 115.

For electromagnetic controlgear, calibrated and traceable AC power meters, power analysers or digital power meters shall be used.

For electronic controlgear, all output power measurements shall be made with a calibrated and traceable wideband power analyser or digital power meter.

For measurements made under the scope of this document, measurement instruments with the following minimum accuracies ~~are to~~ shall be used:

a) for frequencies ≤ 1 kHz
   - voltage: 0,5 %
   - current: 0,5 %
   - power: 1,0 %
   - frequency: 0,1 %

b) for frequencies > 1 kHz
   - voltage: 1,5 %
   - current: 1,0 %
   - power: 2,0 %
   - frequency: 0,1 %

~~Stability of the measurement values (V, A or W) is given if the data does not deviate from more than 1 % in a time frame of 15 min. If any of these values vary with time, the power is determined as the arithmetic mean value over a sufficient period.~~

### 4.10 Multi-rated voltage controlgear

If a controlgear is designed for more than one rated voltage, the controlgear manufacturer shall declare the rated voltage(s) at which the given efficiency and standby power is valid.

### 4.11 Sensor and network connections

~~For the measurement of all kinds of controlgear power (also standby) the power consumed by all circuits (internal or external) which are not involved in power conversion for the controlgear operation (e.g. communication devices, external sensors, auxiliary load, battery charging circuits) shall be excluded from the measurements. If the auxiliary cannot be disconnected, its effect shall be otherwise eliminated from the result.~~

~~NOTE Power consumed by circuits necessary for the proper operation of power conversion is considered in the measurement (e.g. cooling fan, signalling lighting).~~

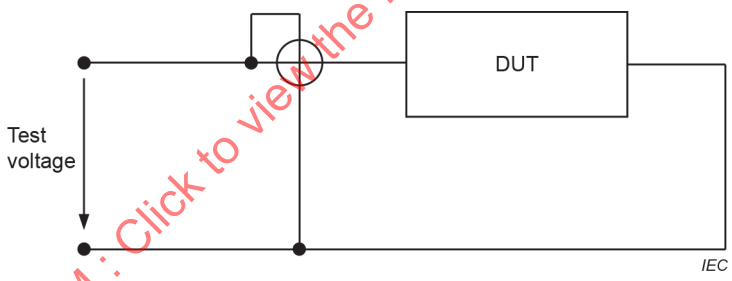
For the measurement of all kinds of controlgear power, the power consumed by all circuits (internal or external) shall be considered as indicated in IEC 63103.

NOTE although the scope of IEC 63103 is limited to non-active mode power, the principle is also suitable for other power measurements.

## 5 Method of measurement of the input power and calculation of the efficiency ~~of controlgear for high intensity discharge lamps~~

### 5.1 Measurement set-up: electromagnetic controlgear

Figure 1 shows the measurement set-up of the power losses of electromagnetic controlgear.




**Key**

DUT device under test

**Figure 1 – Measurement set-up for electromagnetic controlgear**

The power losses ($P_{losses}$) of the electromagnetic controlgear will be measured based on the rated lamp current through the electromagnetic controlgear. Therefore the current through the electromagnetic controlgear will be adjusted by the test voltage to the current defined in the data sheet of the lamp(s). Tolerance for the current is ±0,5 %.

The measurements are carried out with a power meter connected to measure the power losses into the electromagnetic controlgear.

The value of the power losses ($P_{losses}$) is recorded when a steady state has been reached (temperature of the electromagnetic controlgear).

The measurement sequence is as follows:

1) Connect the DUT according to Figure 1.
2) Switch on the test voltage and adjust the test voltage until the rated lamp current is obtained.

3) Await the thermal equilibrium and if necessary adjust the test voltage again to match the rated lamp current.

4) Measure the power losses.

NOTE In the case of independent electromagnetic controlgear which incorporate an ignitor in the same enclosure, the test is only applicable to the electromagnetic controlgear.

The measurement set-up circuit for constant power controlgear shall also be used in a suitable way with the current defined in the data sheets of the lamp(s).

### 5.2 Efficiency calculation: electromagnetic controlgear

~~For the calculation of the efficiency of electromagnetic controlgear ($\eta_{MCG}$), Equation (1) should be used:~~

$$\eta_{MCG} = \frac{P_{lamp\ rated}}{P_{lamp\ rated} + P_{losses}} \quad (1)$$

For the calculation of the controlgear efficiency ($\eta_{CG}$), Equation (1) should be used:

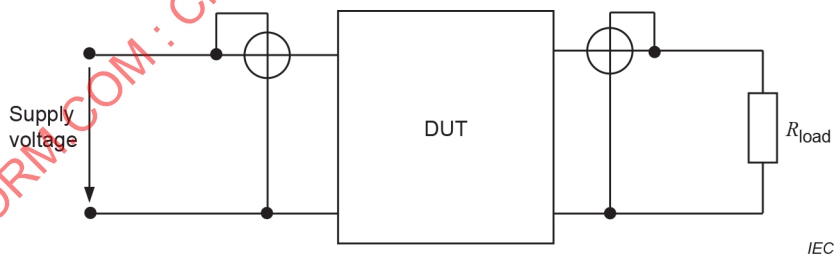
$$\eta_{CG} = \frac{P_{lamp\ rated}}{P_{lamp\ rated} + P_{losses}} \quad (1)$$

where

$P_{lamp\ rated}$ is the lamp power given in the lamp data sheet (in W).

### 5.3 Measurement set-up: electronic controlgear

Figure 2 illustrates the measurement set-up of the input and the output power of electronic controlgear.




**Key**

DUT device under test

$R_{load}$ lamp ~~replacement~~ substitution resistor = load resistor

NOTE ~~Due~~ Owing to the unstable lamp situation for ~~high intensity~~ discharge lamps and for a good reproducibility, as a replacement for the lamps, a resistor ($R_{load}$) is used.

**Figure 2 – Measurement set-up for electronic controlgear**

If $R_{load}$ is not given on the lamp data sheet, $R_{load}$ is determined by dividing the rated~~/~~ or typical lamp voltage squared by the rated~~/~~ or typical lamp power (as applicable). The value of the resistance shall be noted in the measurement report.

The measurements are carried out with power meters connected to measure the total input power into the electronic controlgear-lamp circuit and the output power of the controlgear (lamp power).

The value of the total input power ($P_{\text{tot meas}}$) is recorded when the temperature of the controlgear is stable. The temperature shall not deviate ~~from~~ by more than 1 K per hour.

The supply voltage for the measurement according to Figure 2 is defined in 4.7.

The measurement sequence is as follows:

1) Connect the DUT according to Figure 2.
2) Switch on the mains voltage.
3) Await the thermal equilibrium.
4) Measure the input and the output power.

To obtain a more accurate value of the efficiency, $R_{\text{load}}$ should be obtained taking into consideration the typical lamp voltage and current for square wave operation.

The measured total input power ($P_{\text{tot meas}}$) of a controlgear-lamp circuit is measured with one electronic lamp controlgear.

### 5.4 Efficiency calculation: electronic controlgear

~~For the calculation of the efficiency of controlgear ($\eta_{\text{ECG}}$), Equation (2) should be used:~~

$$\eta_{\text{ECG}} = \frac{P_{\text{Lamp}}}{P_{\text{tot meas}}} \qquad \text{~~(2)~~}$$

For the calculation of the controlgear efficiency ($\eta_{\text{CG}}$), Equation (2) should be used:

$$\eta_{\text{CG}} = \frac{P_{\text{Lamp}}}{P_{\text{tot meas}}} \qquad (2)$$

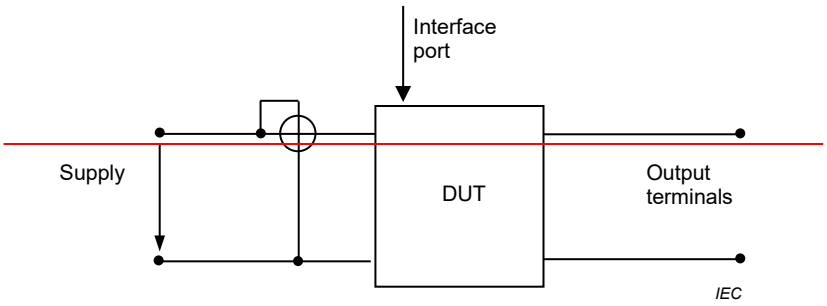
where

$P_{\text{tot meas}}$ is the measured total input power into the controlgear-lamp circuit under test (in W);

$P_{\text{Lamp}}$ is the measured output power of the controlgear under test (lamp power = power at the substitution resistor) in the test circuit (in W).

### 5.5 Standby power measurement of electronic controlgear

~~Figure 3 illustrates the measurement setup of the standby power of electronic controlgear.~~




~~Key~~

~~DUT device under test~~

**~~Figure 3 – Measurement setup of the standby power of electronic controlgear~~**

~~The output circuit (terminals) of the controlgear is open (not connected to a substitution resistor).~~

~~The measurements are carried out with a power meter connected to measure the total input power into the electronic controlgear.~~

~~If a controlgear is also designed for functions other than lamp operation, all these additional functions shall be switched-off during the test.~~

~~NOTE Controlgear with additional power supply for the digital addressable lighting interface could be possible.~~

~~The value of the standby power ($P_{ECGstandby}$) (total input power) is recorded when a steady state has been reached (temperature of the electronic controlgear).~~

~~The supply voltage for the measurement according to Figure 3 is defined in 4.8.~~

~~If the stand-by power varies within the time, the power is determined as the arithmetic mean value over a sufficient period.~~

~~The measurement sequence is as follows:~~

~~1) Connect the DUT according to Figure 3.~~

~~2) Switch on the mains voltage.~~

~~3) Control the output power of the electronic controlgear via the interface port (for example "digital addressable lighting interface") to the standby mode.~~

~~4) Await the thermal equilibrium.~~

~~5) Measure the standby power (total input power).~~



The measurement of standby power of electronic controlgear shall be performed according to IEC 63103.

### 5.6 Networked standby power measurement of electronic controlgear

The measurement of networked standby power of electronic controlgear shall be performed according to IEC 63103.

### 5.7 Reporting of power measurements

Power measurements shall be reported in W with the minimum following resolution:

– ≥ 10 W: whole number;
– > 1 W and < 10 W: first decimal digit;
– ≤ 1 W: two decimal digits.

# Bibliography

IEC 60188, *High-pressure mercury vapour lamps – Performance specifications*

IEC 60662, *High-pressure sodium vapour lamps – Performance specifications*

IEC 60923, *Auxiliaries for lamps – Ballasts for discharge lamps (excluding tubular fluorescent lamps) – Performance requirements*

IEC 61167, *Metal halide lamps – Performance specification*

IEC 62035, *Discharge lamps (excluding fluorescent lamps) – Safety specifications*

IEC 62442-1~~:2018~~, *Energy performance of lamp controlgear – Part 1: Controlgear for fluorescent lamps – Method of measurement to determine the total input power of controlgear circuits and the efficiency of controlgear*

IEC 62442-3, *Energy performance of lamp controlgear – Part 3: Controlgear for tungsten-halogen lamps and LED light sources – Method of measurement to determine the efficiency of controlgear*

ISO/IEC Guide 98-3~~:2008~~, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

# IEC 62442-2

Edition 3.0 2022-02

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Energy performance of lamp controlgear –**
**Part 2: Controlgear for discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear**

**Performance énergétique des appareillages de lampes –**
**Partie 2: Appareillages des lampes à décharge (à l'exclusion des lampes à fluorescence à vapeur de mercure à basse pression) – Méthode de mesurage pour la détermination du rendement des appareillages**

IEC 62442-2:2022-02(en-fr)

# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

# ENERGY PERFORMANCE OF LAMP CONTROLGEAR –

# Part 2: Controlgear for discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear

## 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.

IEC 62442-2 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lighting. It is an International Standard.

This third edition cancels and replaces the second edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the title of Part 2 has been modified;
b) this edition has been harmonized with IEC 62442-1 and IEC 62442-3;
c) the reference to and use of the measurement methods for non-active power consumption in accordance with IEC 63103 have been added.

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

| Draft | Report on voting |
|---|---|
| 34C/1546/FDIS | 34C/1549/RVD |

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62442 series, published under the general title *Energy performance of lamp controlgear*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

# ENERGY PERFORMANCE OF LAMP CONTROLGEAR –

# Part 2: Controlgear for discharge lamps (excluding low-pressure mercury fluorescent lamps) – Method of measurement to determine the efficiency of controlgear

## 1 Scope

This part of IEC 62442 defines a measurement method of the power losses of electromagnetic controlgear, the total input power and the standby power of electronic controlgear for discharge lamps (excluding low-pressure mercury fluorescent lamps). A calculation method of the efficiency of controlgear for discharge lamp(s) is also defined.

It is assumed that the controlgear are designed for use on DC supplies up to 1 000 V and/or AC supplies up to 1 000 V at 50 Hz or 60 Hz.

This document applies to electrical controlgear-lamp circuits comprised solely of the controlgear and of the lamp(s).

NOTE Requirements for testing individual controlgear during production are not included.

This document specifies the measurement method for the total input power, the standby power and the calculation method of the lamp controlgear efficiency for all controlgear sold for domestic and normal commercial purposes operating with discharge lamps.

This document does not apply to:

– controlgear which form an integral part of lamps;
– controlgear circuits with capacitors connected in series;
– controllable electromagnetic controlgear.

## 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 (IEV) – Part 845: Lighting* (available at http://www.electropedia.org)

IEC 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*

IEC 63103:2020, *Lighting equipment – Non-active mode power measurement*

IEC TS 63105:2021, *Lighting systems and related equipment – Vocabulary*

IEC Guide 115:2021, *Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845 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

**3.1**
**nominal value**
suitable approximate quantity value used to designate or identify a component, device or equipment

Note 1 to entry: To express the "nominal value" of a particular quantity, the term "value" is replaced by the quantity name; for example, nominal power, nominal voltage, and nominal current.

[SOURCE: IEC 62442-1:2022, 3.1]

**3.2**
**rated value**
value of a quantity, used for specification purposes, declared by the manufacturer or responsible vendor and established under standard test conditions

Note 1 to entry: To express the "rated value" of a particular quantity, the term "value" is replaced by the quantity name; for example, rated power, rated voltage, rated current, and rated temperature.

[SOURCE: IEC 60050-845:2020, 845-27-100, modified – Note 2 to entry has been deleted.]

**3.3**
**controlgear**
one or more components between the supply and one or more lamps which can serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference

[SOURCE: IEC 62442-1:2022, 3.3]

**3.4**
**electromagnetic controlgear**
**magnetic controlgear**
controlgear which by means of inductance, or a combination of inductance and capacitance, serves mainly to limit the current of the electric lamp(s)

[SOURCE: IEC 60050-845:2020, 845-28-052, modified – The second preferred term has been added.]

**3.5**
**electronic controlgear**
<of discharge lamp> AC and/or DC supplied electronic circuit including stabilizing elements for starting and operating one or more lamp(s)

**3.6**
**discharge lamp**
lamp in which the light is produced, directly or indirectly, by an electric discharge through a gas, a metal vapour or a mixture of several gases and vapours

**3.7**
**controlgear-lamp circuit**
electrical circuit, or part thereof, normally built in a luminaire, consisting of the controlgear and lamp(s)

[SOURCE: IEC 62442-1:2022, 3.7]

**3.8**
**standby mode**
<of controlgear> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger not being a trigger from a network

Note 1 to entry: Examples of external triggers are sensing or timing.

[SOURCE: IEC 63103:2020, 3.10, modified – The domain "<of lighting equipment>" has been replaced with "<of controlgear>".]

**3.9**
**networked standby mode**
<of controlgear> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger being a trigger from a network

[SOURCE: IEC 63103:2020, 3.11, modified – The domain "<of lighting equipment>" has been replaced with "<of controlgear>".]

**3.10**
**standby power**
<of controlgear> average power consumption in the standby mode

**3.11**
**networked standby power**
<of controlgear> average power consumption in the networked standby mode

**3.12**
**total input power**
total power consumed by the controlgear-light source circuit measured at rated input voltage

**3.13**
**controlgear efficiency**
$\eta_{CG}$
ratio of the output power to the lamp(s) and the input power of the controlgear

Note 1 to entry: Loads from sensors, network connections or other auxiliaries are disconnected or, if not possible, otherwise eliminated from the result.

**3.14**
**multi-lamp type controlgear**
single-lamp controlgear designed for the operation of more than one type of lamp with different electrical characteristics, for example power

**3.15**
**controllable controlgear**
controlgear whose light sources operating characteristics can be changed by means of a signal via mains or control input(s)

Note 1 to entry: Signal control is either wired or wireless.

# 4 General

## 4.1 General notes on tests

The measurement conditions specified in IEC 61347-1:2015, Clauses H.1, H.2, H.4, H.8, H.9 and H.11 shall be applied unless otherwise specified in this document. The device under test (DUT) shall be placed according to IEC 61347-1:2015, Figure H.1.

An AC or DC voltage source shall be used to provide input voltage to the DUT. During the tests, the supply voltage and the frequency shall be maintained constant within ±0,5 % during the warm-up period. However, during the actual measurement, the voltage shall be adjusted to within ±0,2 % of the specified testing value.

Unless otherwise specified in IEC 63103, stability of the measurement values (V, A or W) is given if the data does not deviate by more than 1 % in a time frame of 15 min. If any of these values vary with time, the power is determined as the arithmetic mean value over a sufficient period.

## 4.2 Controllable controlgear

In the case of controllable controlgear, the test shall be carried out with the maximum output power.

Requirements for other than 100 % light output operation of controllable controlgear and multi-tapped electromagnetic controlgear are under consideration.

## 4.3 Multi-lamp type controlgear

If a single-lamp controlgear is designed for different lamp powers then the test shall be carried out for each lamp.

The test for multi-lamp controlgear shall be carried out with all possible combinations.

## 4.4 Measurement uncertainty

Measurement uncertainty shall be managed in accordance with the accuracy method in IEC Guide 115:2021, 4.4.3.

## 4.5 Sampling of controlgear for testing

The requirements and tolerances specified in this document are based on the testing of a type test sample submitted by the manufacturer for that purpose. This sample should consist of units having characteristics typical of the manufacturer's production and be as close to the production centre point values as possible.

## 4.6 Size of the test sample

Tests are carried out with one test specimen.

## 4.7 Power supply

Where the test voltage and frequency are not defined by national or regional requirements, the controlgear manufacturer shall declare the nominal voltage(s) at which the given efficiency is valid.

Test voltage(s) and test frequency(ies) shall be the nominal voltage and the nominal frequency of the country or region for which the measurement is being determined (refer to Table 1).

**Table 1 – Typical nominal electricity supply details for some regions**

| Country or region | Nominal voltage and frequency [a] |
|---|---|
| Europe | 230 V; 50 Hz |
| North America | 120 V, 277 V; 60 Hz |
| Japan [b] | 100 V, 200 V; 50/60 Hz |
| China | 220 V; 50 Hz |
| Australia and New Zealand | 230 V; 50 Hz |
| South Africa | 230 V, 50 Hz |

[a] Values are for single phase only. Some single phase supply voltages can be double the nominal voltage above (centre transformer tap). The voltage between two phases of a three-phase system is 1,73 times single phase values (e.g. 400 V for Europe).

[b] 50 Hz is applicable for the Eastern part and 60 Hz for the Western part.

The above table can require test voltages additional to those required in IEC 63103.

### 4.8 Supply voltage waveform

The total harmonic content of the supply voltage when supplying the DUT shall not exceed 3 %; harmonic content is defined as the root-mean-square (RMS) summation of the individual components using the fundamental as 100 %.

The ratio of peak value to RMS value of the test voltage (i.e. crest factor) shall be between 1,34 and 1,49.

### 4.9 Instrument accuracy

For measurement uncertainty and traceability see ISO/IEC Guide 98-3 and IEC Guide 115.

For electromagnetic controlgear, calibrated and traceable AC power meters, power analysers or digital power meters shall be used.

For electronic controlgear, all output power measurements shall be made with a calibrated and traceable wideband power analyser or digital power meter.

For measurements made under the scope of this document, measurement instruments with the following minimum accuracies shall be used:

a) for frequencies ≤ 1 kHz
   - voltage: 0,5 %
   - current: 0,5 %
   - power: 1,0 %
   - frequency: 0,1 %

b) for frequencies > 1 kHz
   - voltage: 1,5 %
   - current: 1,0 %
   - power: 2,0 %
   - frequency: 0,1 %

### 4.10 Multi-rated voltage controlgear

If a controlgear is designed for more than one rated voltage, the controlgear manufacturer shall declare the rated voltage(s) at which the given efficiency and standby power is valid.

### 4.11 Sensor and network connections

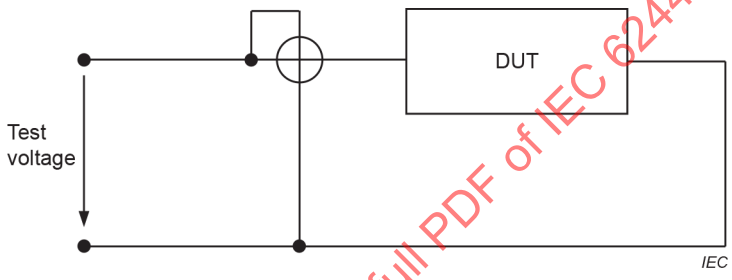
For the measurement of all kinds of controlgear power, the power consumed by all circuits (internal or external) shall be considered as indicated in IEC 63103.

NOTE although the scope of IEC 63103 is limited to non-active mode power, the principle is also suitable for other power measurements.

## 5 Method of measurement of the input power and calculation of the efficiency

### 5.1 Measurement set-up: electromagnetic controlgear

Figure 1 shows the measurement set-up of the power losses of electromagnetic controlgear.




**Key**

DUT device under test

**Figure 1 – Measurement set-up for electromagnetic controlgear**

The power losses ($P_{losses}$) of the electromagnetic controlgear will be measured based on the rated lamp current through the electromagnetic controlgear. Therefore the current through the electromagnetic controlgear will be adjusted by the test voltage to the current defined in the data sheet of the lamp(s). Tolerance for the current is ±0,5 %.

The measurements are carried out with a power meter connected to measure the power losses into the electromagnetic controlgear.

The value of the power losses ($P_{losses}$) is recorded when a steady state has been reached (temperature of the electromagnetic controlgear).

The measurement sequence is as follows:

1) Connect the DUT according to Figure 1.
2) Switch on the test voltage and adjust the test voltage until the rated lamp current is obtained.
3) Await the thermal equilibrium and if necessary adjust the test voltage again to match the rated lamp current.
4) Measure the power losses.

NOTE In the case of independent electromagnetic controlgear which incorporate an ignitor in the same enclosure, the test is only applicable to the electromagnetic controlgear.

The measurement set-up circuit for constant power controlgear shall also be used in a suitable way with the current defined in the data sheets of the lamp(s).

### 5.2 Efficiency calculation: electromagnetic controlgear

For the calculation of the controlgear efficiency ($\eta_{CG}$), Equation (1) should be used:

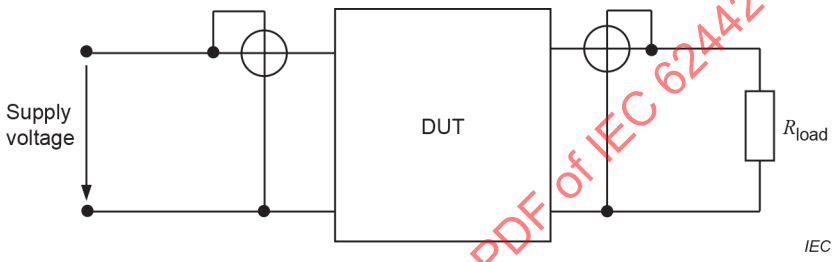
$$\eta_{CG} = \frac{P_{\text{lamp rated}}}{P_{\text{lamp rated}} + P_{\text{losses}}} \quad (1)$$

where

$P_{\text{lamp rated}}$ is the lamp power given in the lamp data sheet (in W).

### 5.3 Measurement set-up: electronic controlgear

Figure 2 illustrates the measurement set-up of the input and the output power of electronic controlgear.




**Key**

DUT device under test

$R_{load}$ lamp substitution resistor = load resistor

NOTE Owing to the unstable lamp situation for discharge lamps and for a good reproducibility, as a replacement for the lamps, a resistor ($R_{load}$) is used.

**Figure 2 – Measurement set-up for electronic controlgear**

If $R_{load}$ is not given on the lamp data sheet, $R_{load}$ is determined by dividing the rated or typical lamp voltage squared by the rated or typical lamp power (as applicable). The value of the resistance shall be noted in the measurement report.

The measurements are carried out with power meters connected to measure the total input power into the electronic controlgear-lamp circuit and the output power of the controlgear (lamp power).

The value of the total input power ($P_{\text{tot meas}}$) is recorded when the temperature of the controlgear is stable. The temperature shall not deviate by more than 1 K per hour.

The supply voltage for the measurement according to Figure 2 is defined in 4.7.

The measurement sequence is as follows:

1) Connect the DUT according to Figure 2.
2) Switch on the mains voltage.
3) Await the thermal equilibrium.
4) Measure the input and the output power.

To obtain a more accurate value of the efficiency, $R_{load}$ should be obtained taking into consideration the typical lamp voltage and current for square wave operation.

The measured total input power ($P_{tot\ meas}$) of a controlgear-lamp circuit is measured with one electronic lamp controlgear.

### 5.4 Efficiency calculation: electronic controlgear

For the calculation of the controlgear efficiency ($\eta_{CG}$), Equation (2) should be used:

$$\eta_{CG} = \frac{P_{Lamp}}{P_{tot\ meas}} \quad (2)$$

where

$P_{tot\ meas}$ is the measured total input power into the controlgear-lamp circuit under test (in W);

$P_{Lamp}$ is the measured output power of the controlgear under test (lamp power = power at the substitution resistor) in the test circuit (in W).

### 5.5 Standby power measurement of electronic controlgear

The measurement of standby power of electronic controlgear shall be performed according to IEC 63103.

### 5.6 Networked standby power measurement of electronic controlgear

The measurement of networked standby power of electronic controlgear shall be performed according to IEC 63103.

### 5.7 Reporting of power measurements

Power measurements shall be reported in W with the minimum following resolution:

– ≥ 10 W: whole number;
– > 1 W and < 10 W: first decimal digit;
– ≤ 1 W: two decimal digits.

# Bibliography

IEC 60188, *High-pressure mercury vapour lamps – Performance specifications*

IEC 60662, *High-pressure sodium vapour lamps – Performance specifications*

IEC 60923, *Auxiliaries for lamps – Ballasts for discharge lamps (excluding tubular fluorescent lamps) – Performance requirements*

IEC 61167, *Metal halide lamps – Performance specification*

IEC 62035, *Discharge lamps (excluding fluorescent lamps) – Safety specifications*

IEC 62442-1, *Energy performance of lamp controlgear – Part 1: Controlgear for fluorescent lamps – Method of measurement to determine the total input power of controlgear circuits and the efficiency of controlgear*

IEC 62442-3, *Energy performance of lamp controlgear – Part 3: Controlgear for tungsten-halogen lamps and LED light sources – Method of measurement to determine the efficiency of controlgear*

ISO/IEC Guide 98-3, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

# SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

# PERFORMANCE ÉNERGÉTIQUE DES APPAREILLAGES DE LAMPES –

# Partie 2: Appareillages des lampes à décharge (à l'exclusion des lampes à fluorescence à vapeur de mercure à basse pression) – Méthode de mesurage pour la détermination du rendement des appareillages

## AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 62442-2 a été établie par le sous-comité 34C: Appareils auxiliaires pour lampes, du comité d'études 34 de l'IEC: Eclairage. Il s'agit d'une Norme internationale.

Cette troisième édition annule et remplace la deuxième édition parue en 2018. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) le titre de la Partie 2 a été modifié;
b) cette édition a été harmonisée avec l'IEC 62442-1 and l'IEC 62442-3;

c) des références à l'IEC 63103 ont été ajoutées afin d'appliquer les méthodes de mesurage de la consommation de puissance en mode non actif.

Le texte de cette Norme internationale est issu des documents suivants:

| Projet | Rapport de vote |
|---|---|
| 34C/1546/FDIS | 34C/1549/RVD |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La version française de cette norme n'a pas été soumise au vote.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 62442, publiées sous le titre général *Performance énergétique des appareillages de lampes*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

# PERFORMANCE ÉNERGÉTIQUE DES APPAREILLAGES DE LAMPES –

# Partie 2: Appareillages des lampes à décharge (à l'exclusion des lampes à fluorescence à vapeur de mercure à basse pression) – Méthode de mesurage pour la détermination du rendement des appareillages

## 1 Domaine d'application

La présente partie de l'IEC 62442 définit une méthode de mesurage des pertes de puissance de l'appareillage de commande électromagnétique, de la puissance d'entrée totale et de la puissance de veille de l'appareillage électronique des lampes à décharge (à l'exclusion des lampes à fluorescence à vapeur de mercure à basse pression). Une méthode de calcul du rendement des appareillages de lampes à décharge est également définie.

Par hypothèse, les appareillages sont conçus pour des alimentations en courant continu jusqu'à 1 000 V et/ou des alimentations en courant alternatif jusqu'à 1 000 V à 50 Hz ou 60 Hz.

Le présent document s'applique aux circuits appareillage-lampe électriques constitués exclusivement de l'appareillage et de la ou des lampes.

NOTE Les exigences pour les essais des appareillages individuels pendant la production ne sont pas incluses.

Le présent document spécifie la méthode de mesurage de la puissance d'entrée totale et de la puissance de veille, ainsi que la méthode de calcul du rendement de l'ensemble des appareillages de lampes à usage domestique et commercial normal, qui fonctionnent avec des lampes à décharge.

Le présent document ne s'applique pas aux:

– appareillages qui font partie intégrante des lampes;
– circuits d'appareillages à condensateurs reliés en série;
– appareillages de commande électromagnétiques gradables.

## 2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050-845, *Vocabulaire électrotechnique international (IEV) – Partie 845: Eclairage* (disponible à l'adresse http://www.electropedia.org)

IEC 61347-1:2015, *Appareillages de lampes – Partie 1: Exigences générales et exigences de sécurité*

IEC 63103:2020, *Appareils d'éclairage – Mesure de puissance en mode non actif*

IEC TS 63105:2021, *Lighting systems and related equipment – Vocabulary* (disponible en anglais seulement)

Guide IEC 115:2021, *Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector* (disponible en anglais seulement)

## 3 Termes et définitions

Pour les besoins du présent document, les termes et définitions de l'IEC 60050-845 et de l'IEC TS 63105 ainsi que les suivants s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse http://www.electropedia.org/
- ISO Online browsing platform: disponible à l'adresse http://www.iso.org/obp

**3.1**
**valeur nominale**
valeur approchée appropriée d'une grandeur, utilisée pour dénommer ou identifier un composant, un dispositif ou un matériel

Note 1 à l'article: Pour exprimer la "valeur nominale" d'une grandeur particulière, le terme "valeur" est remplacé par le nom de la grandeur; par exemple, puissance nominale, tension nominale et courant nominal.

[SOURCE: IEC 62442-1:2022, 3.1]

**3.2**
**valeur assignée**
valeur d'une grandeur, utilisée à des fins de spécification, établie dans des conditions normales d'essai et telle que déclarée par le fabricant ou le fournisseur responsable

Note 1 à l'article: Pour exprimer la "valeur assignée" d'une grandeur particulière, le terme "valeur' est remplacé par nom de la grandeur; par exemple, puissance assignée, tension assignée, courant assigné et température assignée.

[SOURCE: IEC 60050-845:2020, 845-27-100, modifié – La Note 2 à l'article a été supprimée.]

**3.3**
**appareillage de commande**
composant unique ou ensemble de composants insérés entre l'alimentation et une ou plusieurs lampes, qui peuvent servir à transformer la tension d'alimentation, limiter le courant de la ou des lampes à la valeur exigée, fournir la tension d'amorçage et le courant de préchauffage, empêcher le démarrage à froid, corriger le facteur de puissance, ou réduire les perturbations radioélectriques

[SOURCE: IEC 62442-1:2022, 3.3]

**3.4**
**appareillage de commande électromagnétique**
**appareillage de commande magnétique**
appareillage de commande qui, via l'inductance, ou une combinaison de l'inductance et de la capacité, sert principalement à limiter le courant de la ou des lampes électriques

[SOURCE: IEC 60050-845:2020, 845-28-052, modifié – Le second terme privilégié a été ajouté.]

**3.5**
**appareillage électronique**
<d'une lampe à décharge> circuit électronique alimenté en courant alternatif et/ou continu, qui comprend des éléments de stabilisation pour l'amorçage et le fonctionnement d'une ou de plusieurs lampes