SLOVENSKI STANDARD
SIST EN 62442-1:2012/oprA1:2017

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Energijske lastnosti krmilne naprave sijalke - 1. del: Krmilna naprava za fluorescentne sijalke - Merilna metoda za ugotavljanje celotne vhodne moči krmilnih vezij in izkoristka krmilne naprave

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 the controlgear

Energieeffizienz von Lampenbetriebsgeräten - Teil 1: Betriebsgeräte für Leuchtstofflampen - Messverfahren zur Bestimmung der Gesamteingangsleistung von Betriebsgeräteschaltungen und des Wirkungsgrades von Betriebsgeräten

Performance énergétique des appareillages de lampes - Partie 1: Appareillages des lampes à fluorescence - Méthode de mesure pour la détermination de la puissance d'entrée totale des circuits d'appareillage et du rendement des appareillages

Ta slovenski standard je istoveten z: **EN 62442-1:2011/prA1:2017**

ICS:

29.140.99	Drugi standardi v zvezi z žarnicami	Other standards related to lamps

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COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 62442-1/AMD1 ED1	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2017-06-09 (2017-06-02)	**2017-08-25**
SUPERSEDES DOCUMENTS:	
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IEC SC 34C : AUXILIARIES FOR LAMPS	
SECRETARIAT: United Kingdom	SECRETARY: Mr Petar Luzajic
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Amendment 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 the controlgear

NOTE FROM TC/SC OFFICERS:

This 'A' version is circulated due to missing line numbering in the French version. The English version remains unchanged.

The closing date remains unchanged.

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 the controlgear

1 Scope

This part of IEC 62442 defines a measurement and calculation method of the total input power for controlgear – lamp circuits when operating with their associated fluorescent lamp(s). The calculation method for the efficiency of the lamp controlgear is also defined. This document applies to electrical controlgear lamp circuits consisting only of the controlgear and the lamp(s). It is intended 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.

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

It specifies the measurement method for the total input power and the calculation method of the controlgear efficiency for all controlgear used for domestic and normal commercial purposes operating with the following fluorescent lamps:

– linear fluorescent lamps;
– single-ended (compact) fluorescent lamps;
– other general purpose fluorescent lamps.

This International Standard does not apply to:

– controlgear which form an integral part of the lamp;
– controllable wire-wound magnetic controlgear;
– luminaires, which rely on additional optical performance aspects.

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 60081:1997, *Double-capped fluorescent lamps – Performance specifications*
IEC 60081/AMD1:2000
IEC 60081/AMD2:2003
IEC 60081/AMD3:2005
IEC 60081/AMD4:2010
IEC 60081/AMD5:2013

IEC 60901:1996, *Single-capped fluorescent lamps – Performance requirements*
IEC 60901/AMD1:1997
IEC 60901/AMD2:2000
IEC 60901/AMD3:2004
IEC 60901/AMD4:2007
IEC 60901/AMD5:2011
IEC 60901/AMD6:2014

IEC 60921:2004, *Ballasts for tubular fluorescent lamps – Performance requirements*
IEC 60921/AMD1:2006

IEC 60929:2011, *AC and/or DC-supplied electronic control gear for tubular fluorescent lamps – Performance requirements*
IEC 60929/AMD1:2015

IEC 61347-2-3:2011, *Lamp control gear – Part 2-3: Particular requirements for AC and/or DC supplied electronic control gear for fluorescent lamps*
IEC 61347-2-3/AMD1:2016

IEC 61347-2-8:2000, *Lamp controlgear – Part 2-8: Particular requirements for ballasts for fluorescent lamps*
IEC 61347-2-8/AMD:2006

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

3.2
limiting value
the greatest or smallest admissible value of one of the quantities

3.3
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

Note 2 to entry: For the different kinds of operation, rated electrical values are given on the lamp data sheets as:

– rated electrical values under “electrical characteristics”, if the lamp is defined for 50 Hz / 60 Hz operation only,
– rated electrical values under “electrical characteristics”, if the lamp is defined for high frequency (≥ 20 kHz) operation only,
– rated electrical values and typical electrical values, if the lamp is defined simultaneously for 50 Hz / 60 Hz operation and high frequency operation
  - for 50 Hz / 60 Hz operation: rated electrical values under “electrical characteristics”, and
  - for high frequency operation: rated electrical values under “typical lamp characteristics”.

3.4
controlgear
one or more components between the supply and one or more lamps which may 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

3.5
electromagnetic or magnetic controlgear
controlgear which by means of inductance, or a combination of inductance and capacitance, serves mainly to limit the current of the lamp(s) to the required value and operates the lamp(s) at the same frequency as the supply frequency

3.6
electronic controlgear
AC and/or DC supplied to AC invertor including stabilizing elements for starting and operating one or more tubular fluorescent lamps, generally at high frequency

3.7
fluorescent lamp
discharge lamp of the low pressure mercury type, in which most of the light is emitted by one or several layers of phosphors excited by the ultra-violet radiation from the discharge

3.8
controlgear – lamp circuit
electrical circuit, or part thereof, normally built in a luminaire, consisting of the controlgear and lamp(s)

3.9
reference ballast
special ballast, either inductive for lamps for operation on AC mains frequencies, or resistive for lamps for operation on high frequency

It is designed for the purpose of providing comparison standards for use in testing ballasts, for the selection of reference lamps and for testing regular production lamps under standardized conditions. It is essentially characterized by the fact that, at its rated frequency, it has a stable voltage/current ratio which is relatively uninfluenced by variations in current, temperature and magnetic surroundings, as outlined in IEC 60929 and IEC 60921.

Note to entry: Annex B provides details of calculating the reference ballast characteristics and the method of operation with the reference ballast.

3.10
reference lamp
lamp selected for testing controlgear which, when associated with a reference controlgear, has electrical characteristics which are close to the rated values or typical lamp characteristics as stated in the relevant lamp standard

Note to entry: For details regarding the tolerances, see Clause B.2.

3.11
rated power of a lamp
P_{Lrated}
power, expressed in watts, of a given lamp type specified by the manufacturer or the supplier, the lamp being operated under specified conditions

3.12
ballast lumen factor
BLF
ratio of the light output of the reference lamp when the ballast under test is operated at its rated voltage, compared with the light output of the same lamp operated with the appropriate reference ballast supplied at its rated voltage and frequency

3.13
total input power
total power supplied to the controlgear – lamp circuit measured at rated input voltage

Note to entry: The rated power specified is related to a specific ballast lumen factor (BLF).

3.14
efficiency of the controlgear
$\eta_{controlgear}$
ratio of the output power to the lamp(s) and the total input power of the controlgear

Note 1 to entry: Detailed measurement method and conditions are given in clause 5.

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

3.15
multi-lamp-power controlgear
controlgear designed to operate one or more lamp(s) with different rated powers

3.16
multi-number-lamp controlgear
controlgear designed to operate simultaneous more than one similar lamp

3.17
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, failed lamp(s) not included

Note 1 to entry: The ignition phase of lamp(s) is excluded from the standby mode.

Note 2 to entry: Failed lamp(s) could lead to falsify measurement results.

3.18
standby power
average power consumption of a controlgear 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: Unit: W.

4 General

4.1 Applicability

The measurement and calculation methods of this standard shall only be used for controlgear which conforms to IEC 61347-2-3 or IEC 61347-2-8.

4.2 Ballast lumen factor

For every controlgear – lamp combination submitted for the test. The ballast lumen factor shall be measured. The ballast lumen factor is defined in 3.12.

$$BLF = \frac{\text{Light}_{\text{test}}}{\text{Light}_{\text{ref}}} \quad (1)$$

where

$\text{Light}_{\text{ref}}$ is the light output of reference lamp connected to reference ballast measured by photocell meter reading;

$\text{Light}_{\text{test}}$ is the light output of the reference lamp connected to the controlgear under test measured by photocell meter reading.

The ballast lumen factor shall be in the range of 0,925 to 1,075. A controlgear with lower ballast lumen factor is not suitable for testing. The upper limit of 1,075 may be exceeded, if the value for maximum lamp operation current and maximum current in any lead to cathodes comply with the rated value in IEC 60081 and IEC 60901.

4.3 Dimmable controlgear

Sufficient cathode temperature shall be produced by the heating circuit at any possible dimming position within the available dimming range of the controlgear as specified by the relevant datasheet in IEC 60081 and IEC 60901.

Dimmable controlgear shall be measured at 100 % and 25 % lumen output of the operated lamp(s).

4.4 Multi-power and/or multi-lamp controlgear

Multi-power-lamp and multi-number-lamp controlgear shall be measured with all the possible lamp power and number of lamp combinations. The manufacturer shall declare relevant BLF for each combination.

4.5 General notes on test

The measurement conditions are specified in IEC 60921:2004 or IEC 60929:2011, Annex A shall be applied, unless otherwise specified in this standard.

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

4.6 Sampling of controlgear for testing

The requirements and tolerances specified in this standard 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.

4.7 Size of the test sample

Tests are carried out with one test specimen.

4.8 Conditioning of lamps

Lamps shall be handled and stabilized as described in IEC 60081:1997 and IEC 60081:1997/AMD4:2010, B.1.1 and in IEC 60901:1996 and IEC 60901:1996/AMD5:2011, B.1.1.

4.9 Test voltages and frequencies

Where the test voltage and frequency are not defined by national or regional requirements, the test voltage and the test frequency 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	Rated voltage and frequency [a, c]
Europe	230 V, 50 Hz
North America	120 V, 277 V, 60 Hz
Japan [b]	100 V, 50/60 Hz
China	220 V, 50 Hz
Australia and New Zealand	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, respectively.

[c] "If the manufacturer advises that for a marked voltage range a discrete value shall be used for measurement, this should be observed.

4.10 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 not involved in power conversion for the controlgear operation (e.g. communication devices, external sensors, auxiliary load, battery charging circuits etc.) shall be excluded for 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).

5 Method of measurement and calculation of total input power of controlgear – lamp circuits and the efficiency of controlgear

5.1 Correction for ballast lumen factor

The total input power measured is corrected to a BLF of 0,95 for wire-wound magnetic controlgear and of 1,00 for high frequency (HF) electronic controlgear. Additionally tolerances of reference lamps are compensated.

5.2 Method of measurement

The measurements are carried out with the power meter connected to measure the total input power into the controlgear – lamp circuit, using:

– for electromagnetic controlgear – lamp circuits:

  the conditions specified in A.6.1 of IEC 60921:2004 and the test circuit of Figure A.1;

– for AC supplied electronic controlgear – lamp circuits:

  the conditions specified in A.6.2 of IEC 60921:2004, as far as applicable, and the test circuit of Figure A.2.

The value of the total input power ($P_{tot.meas.}$) is recorded when a steady state has been reached (controlgear temperature and lamp current stabilized).

The measurements with the controlgear under test in the controlgear – lamp circuit are to be made with the rated supply voltage. P_{Lrated} of a reference lamp, in some cases, may deviate from the nominal value of the lamp.