SLOVENSKI STANDARD
SIST EN 62442-2:2014/oprA1:2017

01-september-2017

Energijske lastnosti krmilne naprave sijalke - 2. del: Krmilna naprava za visoko intenzivnostne razelektritvene sijalke (razen fluorescenčne sijalke) - Merilna metoda za ugotavljanje učinkovitosti krmilne naprave

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

Energieeffizienz von Lampenbetriebsgeräten - Teil 2: Betriebsgeräte für Hochdruck-Entladungslampen (ausgenommen Leuchtstofflampen) - Messverfahren zur Bestimmung des Wirkungsgrades von Betriebsgeräten

Performance énergétique des appareillages de lampes - Partie 2: Appareillages des lampes à décharge à haute intensité (à l'exclusion des lampes à fluorescence) - Méthode de mesure pour la détermination du rendement des appareillages

Ta slovenski standard je istoveten z: **EN 62442-2:2014/prA1:2017**

ICS:

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

SIST EN 62442-2:2014/oprA1:2017 **en**

34C/1336A/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 62442-2/AMD1 ED1	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2017-06-09 (2017-06-02)	**2017-08-25**
SUPERSEDES DOCUMENTS:	
34C/1280/CD,34C/1330/CC	

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

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Amendment 1 - Energy performance of lamp controlgear - Part 2: Controlgear for high intensity discharge lamps (excluding fluorescent lamps) - Method of measurement to determine 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 2: Controlgear for high intensity discharge lamps (excluding fluorescent lamps) – Method of measurement to determine the efficiency of the controlgear

1 Scope

This part of the IEC 62442 series 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 lamps (excluding fluorescent lamps). Also a calculation method of the efficiency for controlgear for high intensity discharged lamp(s) is defined.

It is assumed that the controlgear are designed for the 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.

It 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 International Standard 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 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*

IEC 61347-2-9:2012, *Lamp controlgear – Part 2-9: Particular requirements for electromagnetic controlgear for discharge lamps (excluding fluorescent lamps)*

IEC 61347-2-12:2005, *Lamp controlgear – Part 2-12: Particular requirements for d.c. or a.c. supplied electronic ballasts for discharge lamps (excluding fluorescent lamps)*
IEC 61347-2-12/AMD1:2010

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 purpose 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

[SOURCE: IEC 62442-1, 3.1]

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

[SOURCE: IEC 62442-1, 3.3, modified – The note has been removed.]

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

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

[SOURCE: IEC 62442-1, 3.4]

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

Frequency of the lamp controlgear is the same as supply frequency

[SOURCE: IEC 62442-1, 3.5]

3.5
electronic controlgear, <used for high intensity discharge lamps>
A.C. and/or D.C. 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, 3.8]

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

3.9
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.

3.10
total input power
total power supplied to the controlgear – light source circuit measured at rated input voltage

[SOURCE: IEC 62442-1, 3.13, modified – The sentence "The rated power specified is related to a specific ballast lumen factor (BLF)." has been removed.]

3.11
efficiency of lamp controlgear, <for high intensity discharge lamps>
η_{MCG}
η_{ECG}
ratio of the output power to lamp(s) and 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 or other auxiliaries are disconnected or if not possible otherwise eliminated from the result.

3.12
multi-lamp type controlgear
controlgear designed for the operation of more than one type of lamp with different electrical characteristics e.g. power

4 General

4.1 Applicability

The measurement and calculation methods of this International Standard shall only be used for lamp controlgear which conforms to IEC 61347-2-9:2012 or IEC 61347-2-12:2005.

4.2 General notes on test

The measurement conditions are 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 standard. 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.

4.3 Controllable controlgear

In 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.

4.4 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.

126 ### 4.5 Measurement uncertainty

127 Measurement uncertainty shall be managed in accordance with the accuracy method in 4.4.3 of
128 the IEC Guide 115:2007.

129 ### 4.6 Sampling of controlgear for testing

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

134 ### 4.7 Size of the test sample

135 Tests are carried out with one test specimen.

136 ### 4.8 Power supply

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

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

142 **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

[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.

143

144 ### 4.9 Supply voltage waveform

145 The total harmonic content of the supply voltage when supplying the DUT shall not exceed 3 %;
146 harmonic content is defined as the root-mean-square (r.m.s.) summation of the individual
147 components using the fundament as 100 %.

148 The ratio of peak value to r.m.s. value of the test voltage (i.e. crest factor) shall be between
149 1,34 and 1,49.

150 ### 4.10 Instrument accuracy

151 For electromagnetic controlgear, calibrated and traceable a.c. power meters, power analysers
152 or digital power meters shall be used. For measurement uncertainty and traceability see
153 ISO/IEC Guide 98.3 and IEC Guide 115.

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

156 For measurements made under the scope of this standard, measurement instruments with the
157 following minimum accuracies are to 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 differ 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.

4.11 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.

4.12 Sensor and Network connections

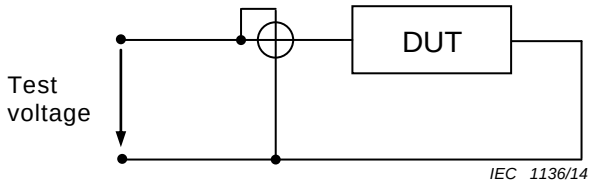
For the measurement of all kinds of controlgear power (also standby) the power consumed by all circuits (internal or external) which not involved in power conversion for the controlgear operation (e.g. communication devices, external sensors, auxiliary load, battery charging circuits etc.) shall be excluded 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 of the input power and calculation of the efficiency of controlgear for high intensity discharge lamps

5.1 Measurement setup: Electromagnetic controlgear

Figure 1 shows the measurement setup of the power losses of electromagnetic controlgear.



Key

DUT Device under test

Figure 1 – Measurement setup 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).

Measurement sequence:

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

The measurement setup circuit for constant power controlgear shall be used in suitable way also 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 (η_{MCG}), Equation (1) should be used:

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

where

$P_{lamp,rated}$ is the lamp power given in the lamp datasheet (in watt).