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Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades of Ballasts for Gas Discharge Lamps for General Lighting

普通照明用气体放电灯用镇流器能效限定值及能效等级

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Standardization Administration of the People's Republic of China.

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Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades of Ballasts for Gas Discharge Lamps for General Lighting

1 Scope

This Document specifies the energy efficiency grades, minimum allowable values of energy efficiency and test methods for ballasts for tubular fluorescent lamps, AC electronic ballasts for single-ended electrodeless fluorescent lamps, ballasts for metal halide lamps and ballasts for high-pressure sodium lamps.

This Document applies to inductive ballasts and electronic ballasts for tubular fluorescent lamps with a rated voltage of 220 V and a frequency of 50 Hz, and a nominal power of 4 W~120 W; electronic ballasts for externally coupled single-ended electrodeless fluorescent lamps with a rated power of 30 W~400 W; independent and built-in inductive ballasts and electronic ballasts for metal halide lamps with a nominal power of 20 W~1,500 W; and independent and built-in inductive ballasts for high-pressure sodium lamps with a nominal power of 70 W~1,000 W.

This Document does not apply to electronic ballasts for non-preheat start fluorescent lamps and non-detachable ballasts that form part of integrated lamps.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 32483.1 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

GB/T 32483.2 Energy performance of lamp controlgear - Part 2: Controlgear for high intensity discharge lamps(excluding fluorescent lamps) - Method of measurement to determine the efficiency of controlgear

GB/T 34841 Fluorescent induction lamps - Performance specification

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 32483.1, GB/T 32483.2 and the following apply.

3.1 Ballast efficiency; η_b

The ratio of the ballast output power (lamp power) to the total input power of the ballast-lamp circuit.

NOTE: Sensors, network connections or other auxiliary loads are disconnected. If they cannot be disconnected, the power of these loads shall be deducted from the result.

3.2 Minimum allowable value of energy efficiency for ballast

The minimum allowable value of ballast efficiency under the test conditions specified in the standard.

3.3 Standby power

Average power consumption of the ballast in standby mode.

NOTE 1: Standby mode is a mode of the ballast where the ballast is connected to the supply voltage and the lighting function is off but can be turned on by an external trigger signal instead of a network trigger signal.

NOTE 2: External trigger signal such as a sensor or timer.

4 Technical Requirements

4.1 Energy efficiency grades

4.1.1 Ballast energy efficiency grades are divided into 3 grades, among which Grade-1 has the highest energy efficiency.

4.1.2 The efficiency of electronic ballasts for tubular fluorescent lamps of various grades shall be no lower than the requirements of Table 1; and the efficiency of inductive ballasts for tubular fluorescent lamps of various grades shall be no lower than the requirements of Table 2.

A.3.2 Power supply voltage

A.3.2.1 Test voltage

When the used power supply voltage range is marked on the ballast, or when the ballast has several different independent rated power supply voltages, the voltage within the power supply voltage range of the ballast or any predetermined voltage can be used as the rated voltage for testing, whichever is the most unfavorable.

A.3.2.2 Power supply stability

During the test, the power supply voltage and frequency in the preheating stage shall be stably maintained within ±0.5% of the rated voltage value; during the actual measurement period, the voltage shall be maintained within ±0.2% of the rated voltage value.

A.3.2.3 Test power supply voltage waveform

The total harmonic content of the test power supply voltage shall not exceed 3%; the harmonic content is defined as the root mean square (RMS) sum of each component with the fundamental frequency as 100%.

A.3.3 Magnetic effect

There shall be no magnetic objects within 25 mm of the surface of the ballast under test, unless otherwise specified.

A.3.4 Requirements for reference lamps

A.3.4.1 Before measurement, the lamp shall be brought into a stable operating state. Discharge instability such as arc swirl or jitter shall not occur.

A.3.4.2 When a lamp that has been aged for at least 100 h is operated with a reference ballast under the conditions specified in this appendix and at an ambient temperature of 25°C (or 35°C as claimed by the manufacturer), if the lamp power, lamp terminal voltage or lamp operating current does not differ by more than 2.5% from the corresponding rated values given in GB/T 34841, then the lamp shall meet the requirements of the reference lamp.

A.3.5 Installation of reference lamp

In order to ensure the consistency of the electrical characteristics of the reference lamp, the orientation of the reference lamp shall comply with the provisions of the parameter table of the corresponding lamp. If the parameter table of the lamp does not specify its orientation, the lamp shall be installed horizontally.

During the test, the lamp should be permanently fixed in its test lamp holder.

A.3.6 Connecting wires and relative installation position

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