



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**DC or AC supplied electronic controlgear for LED modules -
Performance specifications**

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1 Scope

This document specifies the performance requirements for the electronic control gear using a DC power supply below 1 000 V and an AC power supply of 50 Hz or 60 Hz, whose output frequency is different from the power supply frequency. This control gear works with the LED modules specified in GB 24819. The LED control gear specified in this document is designed to provide a constant voltage or current. This document also covers types that do not comply with pure voltage and current.

This document applies to the electronic control gear for LED modules with a DC power supply below 1 000 V and an AC power supply of 50 Hz or 60 Hz.

Note 1: The tests in this document are type tests. Test requirements for individual control gears during production are not included.

Note 2: The requirement for a control gear equipped with a device capable of changing the output power is still under study.

Note 3: It can be expected that, as long as the LED module manufacturer's product specifications are considered, the control gear in accordance with this document can guarantee normal operation between 92% and 106% of the rated supply voltage.

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 version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB 19510.1, Lamp control gear - Part 1: General and safety requirements (GB 19510.1-2009, IEC 61347-1:2007, IDT)

GB 19510.14, Lamp controlgear - Part 14: Particular requirements for d.c. or a.c.

supplied electronic controlgear for LED modules (GB 19510.14-2009, IEC 61347-2-13:2006, IDT)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in GB 19510.1 and the following apply.

3.1 Total circuit power

The total power consumed by the control gear and the LED module together at the rated supply voltage of the control gear and the rated maximum output load.

3.2 Circuit power factor

The ratio of the measured power of the circuit to the product of the supply voltage (rms) and the supply current (rms).

3.3 Controlgear for LED module circuitry with high input capacitance

Control gear suitable for high capacitance LED modules connected directly or indirectly to the input terminals.

Note 1: Examples are LED modules with switch-mode power conversion circuit, such as boost-buck converter.

Note 2: Normally, capacitance over 100 nF are considered high capacitance.

3.4 Controlgear for LED module circuitry with low input capacitance

Control gear suitable for low capacitance or no capacitance LED modules connected

directly or indirectly to the input terminals.

Note 1: Examples are LED modules with only LEDs or with logic circuits for thermal protection, but not directly modifying the power provided by the control gear, or linear voltage regulators.

Note 2: Normally, capacitance of 100 nF and below are considered low capacitance.

4.1 The tests specified in this document are all type tests. The requirements and

tolerances stated in this document are based on tests performed on type test samples submitted by the manufacturer for this purpose. Such type test samples shall generally have the typical characteristics of the manufacturer's product and shall be as close as possible to the center point value of the product.

According to the output voltage, it is divided into:

- a) control gear with a stable output voltage;
- b) control gear without a stable output voltage.

5.3 Classification according to output current

According to the output current, it is divided into:

- a) control gear with a stable output current;
- b) control gear without a stable output current.

5.4 Classification according to output isolation

According to the output isolation, it is divided into:

- a) isolated output control gear;
- b) self-coupling control gear (i.e., non-isolated output control gear).

6.1.1 The control gear shall be clearly marked with the following:

Circuit power factor, for example: $\lambda = 0.9$.

For control gear where the power factor is not constant over the rated output range and/or has a supply voltage range, the power factor may vary for different combinations of supply voltage and output power. In this case, the range of power factor, for example $\lambda = 0.8 \sim 0.9$, shall be indicated on the control gear.

If the power factor is less than 0.95 leading, the letter C shall be added after it, for example $\lambda = 0.9C$.

6.1.2 In addition to the above mandatory markings, the following information shall also

be marked on the control device or indicated in the manufacturer's catalog or similar documents:

- a) the allowable temperature range, if applicable;
- b) an indication that the control gear has a stable output voltage, if applicable;
- c) an indication that the control gear has a stable output current, if applicable;
- d) an indication that the control gear is suitable for use with the mains dimmer, if applicable;
- e) a statement of the mode of operation, e.g., phase control, if applicable;
- f) $Prated_min$, the rated minimum output power of the control gear for normal operation, if applicable.

Note: $Prated_min$ can be a marking with $Prated$, e.g., $Prated = 20\text{ W}, \dots, 60\text{ W}$.

6.2 Optional marking

The following shall be declared in the control gear or the manufacturer's catalog or the like:

- a) total circuit power;
- b) if applicable, a statement of the short-circuit protection of the control gear (symbol under consideration).

7.1 Starting and connecting requirements

After starting or connecting to an LED module, the output shall be within 110% of the rated value within 2 s. The maximum current or maximum voltage shall not exceed the manufacturer's given value. This performance is tested at minimum rated power.

Note: If the output voltage is AC, 110% is the percentage of effective value, if it is DC, 110% is the percentage of DC value.

7.2 Voltage and current during operation

For a control gear with an unsteady output voltage, under the rated power supply voltage, the deviation between the output voltage and the rated voltage of the LED module shall not exceed $\pm 10\%$; for a control gear with a stable output voltage, when the power supply voltage is any value between 92% and 106% of the rated power supply voltage, the deviation between the output voltage and the rated voltage of the LED module shall not exceed $\pm 10\%$.

For a control gear with an unsteady output current, under the rated power supply voltage,