



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 7622 : 2002
(JELMA/JSA)

**Glow-Starters for fluorescent
lamps—Performance Specification**

ICS 29.140.30

Reference number : JIS C 7622 : 2002 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Japan Electric Lamp Manufacturers Association (JELMA)/the Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on *Section 2—Performance Specification* in **IEC 60155 : 1993 Glow-Starters for fluorescent lamps** for the purposes of making easy to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of International Standard which is based on Japanese Industrial Standard.

This Standard specifies the performance of glow-starters for fluorescent lamps, therefore **JIS** for individual product specification shall be referred as the provisions for the safety and quality inherent to the product.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Date of Establishment: 2002-11-20

Date of Public Notice in Official Gazette: 2002-11-20

Investigated by: Japanese Industrial Standards Committee

Standards Board

Technical Committee on Electricity technology

JIS C 7622:2002, First English edition published in 2003-08

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Printed in Japan

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Glow-Starters for fluorescent lamps— Performance Specification

Introduction This Japanese Industrial Standard has been prepared based on *Section 2—Performance Specification* in **IEC 60155** *Glow-Starters for fluorescent lamps* published in 1993 as the fourth edition according to Amendment 1 (1995) with some alterations in the technical contents. The principal alteration is that starters with E type cap not specified in the corresponding International Standard are additionally specified.

In this Standard, the portions shown by sidelines or dotted underlines are the portions where the original International Standard is modified. The list of modification is shown in Annex 2 (informative) together with explanations for each modification.

1 Scope This Standard specifies performances of interchangeable glow-starters used with pre-heating type fluorescent lamps (hereafter referred to as “starters”).

- Remarks 1 Starters are generally designed to operate with a range of lamps, depending on supply voltage, single lamp or series pair operation, maximum lamp voltage and lamp starting requirements.
- 2 The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

IEC 60155 : 1993 *Glow-Starters for fluorescent lamps* and Amendment 1 1995.10 (MOD)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied, if the year of coming into effect is not appended.

JIS C 7601 *Fluorescent lamps for general lighting service*

- Remarks : Specifications taken from the following International Standards
- IEC 60081** : 1984 *Double-capped fluorescent lamps—Performance specifications*,
- IEC 60901** : 1996 *Single-capped fluorescent lamps—Performance specifications*,
- IEC 61195** : 1993 *Double-capped fluorescent lamps—Safety specifications* and,
- IEC 61199** : 1993 *Single-capped fluorescent lamps—Safety specifications* are equivalent to the said standard.

JIS C 7619 *Glow-starters for fluorescent lamps—General and safety requirements*

Remarks : Specifications taken from **IEC 60155 : 1993** (including Amendment 1, 1995) *Glow-starters for fluorescent lamps* are equivalent to the said standard.

JIS C 7709-1 *Lamp caps and holders together with gauges for the control interchangeability and safety—Part 1 : Lamp caps*

Remarks : Specifications taken from **IEC 60061-1 : 1969** *Lamp caps and holders together with gauges for control of interchangeability and safety—Part 1 : Lamp caps* are equivalent to the said standard.

JIS C 8108 *Ballasts for fluorescent lamps*

JIS C 8118-2 *Ballasts for tubular fluorescent lamps—Part 2 : Performance requirements*

Remarks : Specifications taken from **IEC 60921 : 1988** *Ballasts for tubular fluorescent lamps. Performance requirements* are equivalent to the said standard.

JIS Z 8113 *Lighting vocabulary*

Remarks : Specifications taken from **IEC 60050 (845) : 1987** *International Electrotechnical Vocabulary Lighting* and **IEC 60400 : 1991** *Lampholders for tubular fluorescent lamps and starterholders* are equivalent to the said standard.

3 Definitions For the purposes of this Standard, in addition to the definitions stated in **JIS Z 8113**, the following principal definitions apply.

3.1 starter A device, other than a main switch, which closes or opens the pre-heating circuit of a fluorescent lamp for the purpose of starting the lamp.

3.2 glow-starter A starter which depends for its operation on a glow discharge in a gaseous atmosphere.

3.2A reclosure voltage The starting test voltage specified in **JIS C 7601**.

3.3 non-reclosure voltage A reduced limit voltage at which the starter must not reclose after operation at the reclosure voltage.

3.3A operation in light To operate a starter under normal room light (not less than 5 Lx).

3.3B operation in dark To operate a starter in an enclosed container which does not transmit light.

3.4 deactivated lamp A lamp in which one or both filaments are deprived of emitting material, but neither of which is broken.

3.5 glow-starters with operating time limitation A glow-starter which prevents prolonged attempts to start lamps which refuse to start, e.g. lamps with deactivated electrodes.

The following types can be distinguished:

- a) starters which are non-resettable (one shot);
- b) starters with a manual reset;
- c) starters with an automatic reset, by actuating the main switch or other intended actions.

3.5A starter with P type cap A starter which uses P21 cap specified in **JIS C 7709-1**.

3.5B starter with E type cap A starter which uses E17/20 cap specified in **JIS C 7709-1**.

4 General requirements Starters shall be so designed and constructed that in normal use their operation is without danger to the user or surroundings. In general, compliance is checked by carrying out all the tests specified.

5 General requirements for tests

5.1 Requirements for tests are specified.

5.2 Unless otherwise specified, the tests shall be made at an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

5.3 The tests shall be carried out in the order of the clauses.

6 Marking The marking shall satisfy the requirements in **6 of JIS C 7619**.

7 Classification Glow-starters are classified in accordance with the assortment by size of applicable lamp and the shape of cap employed and expressed by type designation.

7.1 Type designation The type designation shall consist of the following items.

First item	Second item	Third item
Symbol denoting glow-starter	Symbol denoting kind of glow-starter	Symbol denoting kind of cap
FG	1 4 5 7	P : P21 cap E : E17/20 cap

7.2 Type designation and applicable lamp The combination of type designation and applicable lamp shall be as given in Attached Table 1.

8 Starting test

8.1 Starting test quantity The starting test quantity shall consist of five new starters which have not been subjected to the test specified in **JIS C 7619**.

8.2 Conditions of acceptance The starters shall be considered as satisfying the requirements of this clause if all five starters comply with the tests specified in 8.4 to 8.7A. If one failure occurs, a further five starters shall be selected and tested and all these shall comply. If more than one failure occurs in the first test, these starters are deemed not to satisfy the requirements of this clause.

8.3 Conditions of test

8.3.1 Unless otherwise specified, the starter shall be in complete darkness for the duration of the test. It shall have been kept in complete darkness for at least 15 h immediately prior to the test. This condition will be satisfied if the starter is enclosed in an opaque container.

8.3.2 Unless otherwise specified, the starter shall be tested in the circuit shown in Attached Fig. 1.

When FG-1E and FG-7E are tested, a capacitor of actual capacitance 0.005 μF to 0.02 μF shall be connected to the starter in parallel in all the tests.

8.3.3 The ballast used shall meet the requirements of **JIS C 8108** or **JIS C 8118-2**. It shall have a rated voltage equal to the mains voltage, or falling within the mains voltage range for which the starter is designed. It shall have a rated wattage suitable for the main type of lamp for which the starter is designed. In case of doubt, a choice shall be made in mutual agreement between testing authority and manufacturer.

Remarks : Generally, the rated voltage shall be the same as the voltage rating of the ballast prescribed in **JIS C 7601** for the lamp starting test.

8.3.4 The lamp used shall meet the requirements of **JIS C 7601** for starter type fluorescent lamps, and shall be selected from the class of lamp given in Attached Table 1, to satisfy the following requirements:

- a) In the tests for speed of operation, closed time and necessary time for lighting in light, the maximum one and the minimum one in the classification by size.
- b) In the tests for non-reclosure voltage, pulse voltage and necessary time for lighting in dark, the maximum one in the classification by size.

8.3.5 The total harmonic content of the supply voltage shall not exceed 3 %. The harmonic content being defined as the root-mean-square (r.m.s.) summation of the individual harmonic components, using the fundamental as 100 %. Care shall be taken that this applies under all conditions that occur during the measurement.

Remarks : This implies that the source of supply shall have sufficient power, and that the supply circuit has a sufficiently low impedance compared with the ballast impedance.

8.4 Speed of operation When the operating test voltage shown in Attached Table 2 is applied to the circuit for 25 s, the contacts of starter shall open not less than 7 times.