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Ballasts for fluorescent lamps

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electric Lamp Manufacturers Association (JELMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS C 8108:1991** is replaced with this Standard.

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Ballasts for fluorescent lamps

Introduction

This Japanese Industrial Standard was established in 1953 and the last revision was made in 1991. Thereafter, **JIS C 8147-1**, **JIS C 8147-2-8** and **JIS C 8118** which conformed to the International Standards have been established. In this revision, these standards were quoted in an attempt to adjust its contents as much as possible to those of the International Standards.

1 Scope

This Standard specifies magnetic type ballasts (hereafter referred to as the “ballasts”) for operating the fluorescent lamps and the low pressure mercury germicidal discharge lamps (hereafter referred to as the “lamps”), specified in **JIS C 7601** and **JIS C 7605**, respectively, which are with rated input voltage not exceeding 300 V a.c. (50 Hz, 60 Hz and 50/60 Hz) and rated secondary voltage not exceeding 1 000 V and are intended for use in general places.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*
- JIS C 1102-1 *Direct acting indicating analogue electrical measuring instruments and their accessories — Part 1 : Definitions and general requirements common to all parts*
- JIS C 1302 *Insulation resistance testers*
- JIS C 1509-1 *Electroacoustics — Sound level meters — Part 1 : Specifications*
- JIS C 1509-2 *Electroacoustics — Sound level meters — Part 2 : Pattern evaluation tests*
- JIS C 1602 *Thermocouples*
- JIS C 7601 *Fluorescent lamps for general lighting service*
- JIS C 7605 *Low pressure mercury germicidal discharge lamps*
- JIS C 8118 *Ballasts for tubular fluorescent lamps — Performance requirements*
- JIS C 8147-1 *Lamp controlgear — Part 1 : General and safety requirements*

JIS C 8147-2-8 *Lamp controlgear — Part 2-8 : Particular requirements for ballasts for fluorescent lamps*

JIS Z 8113 *Lighting vocabulary*

3 Terms and definitions

For the purposes of this Standard, in addition to the terms and definitions given in JIS Z 8113, the following principal terms and definitions shall apply:

3.1 magnetic type ballast

the ballast is a device mainly composed of a transformer and choke coil, and a capacitor and the like are combined if necessary, to be used for proper operation of lamps

In some cases, such devices as a capacitor for radio-interference suppression, capacitor for power-factor improvement, capacitor discharge resistor, protective device, starting semiconductor element, etc. are called the ballast.

3.2 reference ballast

a choke-coil type ballast intended for use as a comparison standard in testing the ballasts and selecting reference lamps

3.3 reference lamp

a lamp which has been sufficiently aged by previous operation for a long period to minimize the change of characteristics, so that it can be used as a load in testing the ballasts

3.4 starter type ballast

a ballast intended for use in a circuit system in which a manual or automatic starter is provided and preheating of the cathodes of the lamp, starting of the lamp by generation of surge voltage, and heating of the cathodes while the lamp is in operation, are performed by the switching action of the starter

3.5 rapid start type ballast

a ballast intended for use in a circuit system, in which the cathodes are preheated by a cathode-heating mechanism provided as a part of the ballast, a sufficient voltage is applied between both cathodes to start discharge when the cathodes have been heated up to a temperature high enough to emit electrons, and cathodes are heated during operation by the lamp current as well as by the above-mentioned cathodes-heating mechanism

3.6 instantaneous start type ballast

a ballast intended for use in a circuit system, in which the cathodes are not preheated before discharge but the lamp is started by applying a necessary and sufficient high voltage across both cathodes, and the cathodes are heated by the lamp current during operation

3.7 semiconductor start type ballast

a ballast intended for use in a circuit system, in which a starting semiconductor element is incorporated in the ballast, the cathodes are preheated by switching action of semiconductor or by cathodes-heating winding, the lamp is started by the switching action of the semiconductor, and the cathodes are heated during operation by the lamp current and/or by the cathode-heating mechanism

3.8 low temperature degree rise type ballast

a ballast in which the permissible temperature rise of the windings is lowered from that of normal temperature rise ballasts so that it can be used in a place where the ambient temperature is higher than the said reduced temperature

In this Standard, only the ones in which the temperature rise is reduced 15 °C or more for class A or E insulation, or 25 °C or more for class B insulation are specified.

3.9 transformer type ballast

a ballast which has functions of transformers

There are some ballasts of this type of which the primary windings are insulated from the secondary windings inside by means of a insulation transformer, while there are others with no such insulation.

3.10 splash protection type ballast

a ballast on which the testing in accordance with the second characteristic number 4 specified in JIS C 0920 has no detrimental effects

3.11 underwater protection type ballast

a ballast which is free from infiltration of the water of such quantity as would have a detrimental effect, when it is subjected to the test in accordance with the second characteristic number 7 specified in JIS C 0920

3.12 thermally protected ballast

a generic name for ballasts with self-resetting protective device, ballasts with non-resetting protective mechanism and overheat protective ballasts

3.13 thermally protected ballast of automatic resetting type

a ballast which has a thermal protective device to prevent excessive rise of the temperature of the mounting surface of the fluorescent lamp luminaire

This device opens the supply side circuit when the temperature inside the ballast rises abnormally by some reason and allows re-lighting of the lamp by automatic re-turning of the circuit when the inside temperature decreases, after the interruption, to the resetting temperature of the protective device.

3.14 thermally protected ballast of non resetting type

a ballast which accommodates a thermal protective device or which is composed of material and/or mechanism so that thermal protective functions are given, to prevent excessive rise of the temperature of the mounting surface of a fluorescent lamp luminaire

This device opens the supply side circuit when the temperature inside the ballast rises abnormally by some reason, and once the circuit is opened it does not return even when the temperature decreases.

3.15 ballast with means of protection against overheating

a ballast which previously prevents overheating of ballast occurring by some cause, in which the surface temperature of the ballast at the time of operation of the thermal protective device, thermal protective mechanism or over-current breaking mechanism (current fuses or the like) is designed somewhat higher than that of a thermally protected ballast of automatic resetting type or a thermally protected ballast of non resetting type

In this ballast there are automatic resetting type and non-resetting type.

Ballasts without current fuses accommodated, if they have a nameplate stating that they should be used in combination with a current fuse, are considered to fall under this category.

3.16 rated input voltage

the reference value of voltage to be applied across input terminals of a complete circuit comprising the ballast and lamp, which is marked on the ballast

3.17 rated frequency

the reference value of frequency of the voltage to be applied across input terminals of a complete circuit comprising the ballast and lamp, which is marked on the ballast

It shall, as a rule, be 50 Hz or 60 Hz.

3.18 rated input current

the reference value of stabilized input current at the ambient temperature of 25 °C, when the ballast is operated under the rated input voltage of the rated frequency employing the reference lamp as the load, which is marked on the ballast

3.19 rated input power

the reference value of stabilized input power at the ambient temperature of 25 °C, when the ballast is operated under the rated input voltage of the rated frequency employing the reference lamp as the load, which is marked on the ballast

3.20 rated secondary voltage

the reference value of secondary no-load voltage, when the rated input voltage of the rated frequency is applied to a transformer type ballast, which is marked on the ballast

3.21 rated secondary current

the current that passes through the lamp when the rated input voltage of the rated frequency is applied to a transformer type ballast, which is the reference value of current of the applicable lamp marked on the ballast

the reference value of secondary short-circuit current which flows steadily, when the rated input voltage of the rated frequency is applied to a transformer type ballast, which is marked on the ballast

the voltage to be applied across the input terminals when various characteristics are measured on the combination of the reference ballast and the reference lamp

Ballasts are classified as given in table 1.

Classification by applicable lamp	Classification by starting system	Classification by location of use	Classification by protection against water	Classification by power factor	Classification by temperature rise	Classification by protective functions and their symbols	
Straight type, circular type and compact type for (without built-in starter)	Starter type	Built-in	No protection	Low power factor	Normal temperature rise type	No protection	
Straight type , circular type	Rapid starter type (phase delay circuit)	Independent	Splash protection (SP)	High power factor	Low temperature rise type	With automatic resetting protective device	
Compact type for (without built-in starter)	Rapid starter type (phase advance circuit)		Underwater protection (WT)			With non-resetting protective mechanism	
Compact type for (with built-in starter)	Instantaneous start type					Overheat protective type	
For slim-line type	Semiconductor start type						
NOTE 1 The terms straight type, circular type, compact type (without built-in starter), compact type (with built-in starter), slim-line type, etc. coincide with those given in JIS C 7601.							
NOTE 2 In the column of classification by starting system, the “phase delay circuit” in rapid start type means a circuit in which the secondary voltage waveform is almost sinusoidal and the “phase advance circuit” means that higher harmonics are included in the secondary voltage waveform. This “phase advance circuit” is generally called “ballast specially considered for starting”.							

The construction shall be as specified in 15.1 (tree, cotton, silk, paper, and similar