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AS/NZS 60923

Australian/New Zealand Standard™

**Auxiliaries for lamps—
Ballasts for discharge lamps
(excluding tubular fluorescent
lamps)—Performance requirements**

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Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Electrical Compliance Testing Association of Australia
Energy Efficiency and Conservation Authority of New Zealand
Illuminating Engineering Society of Australia and New Zealand
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Ballasts for discharge lamps
(excluding tubular fluorescent
lamps)—Performance requirements**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/41, Lamps and Related Equipment, to supersede, in part, AS 1468—1974, *Ballasts for high pressure mercury vapour and low pressure sodium vapour discharge lamps*, which was withdrawn in July 1997.

The objective of this Standard is to specify performance requirements for ballasts for discharge lamps such as high-pressure vapour, low-pressure sodium vapour, high-pressure sodium vapour and metal halide lamps, but not tubular fluorescent lamps.

In January 1997, the IEC commenced numbering its Standards from 60000 by adding 60000 to the number of each existing Standard. This coordinates IEC numbering with ISO numbering. During the transition period an IEC Standard might be identified by its new number or its old number (for example, IEC 60050 or IEC 50).

This Standard is technically equivalent to and has been reproduced from IEC 60923:1995, *Auxiliaries for lamps—Ballasts for discharge lamps (excluding tubular fluorescent lamps)—Performance requirements*, and has been varied as indicated to take account of Australian/New Zealand conditions.

Variations to IEC 60923:1995 are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies IEC tables, figures and passages of text which, for the purposes of this Australian/New Zealand Standard, are deleted. Where Australian/New Zealand tables, figures or passages of text are added, each is set in its proper place and identified by shading (~~example~~). Added figures are not themselves shaded, but are identified by a shaded border.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

In this Standard, the following print types are used:

- requirements proper: in arial type;
- *test specifications: in italic type;*
- explanatory matter: in smaller arial type.

A reference to an International Standard identified in the Normative References Clause by strikethrough (~~example~~) is replaced by a reference to the Australian or Australian/New Zealand Standard(s) listed immediately thereafter and identified by shading (~~example~~). Where the struck-through referenced document and the referenced Australian or Australian/New Zealand Standard are identical, this is indicated in parenthesis after the title of the latter.

The term 'normative' has been used in this Standard to define the application of the annex to which it applies. A normative annex is an integral part of a Standard.

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INTRODUCTION

This standard covers performance requirements for ballasts for discharge lamps. It is to be read in conjunction with IEC 60922, with which all ballasts covered by the present standard shall comply.

In order to obtain satisfactory performance of discharge lamps and their associated ballasts, it is necessary that certain features of their design be properly coordinated. Therefore, it is essential that specifications for them be written in terms of measurements made against some common baseline of reference, which should be permanent and reproducible.

These conditions may be fulfilled by special or selected inductive-type ballasts, called "reference ballasts". These ballasts may be used for testing ordinary ballasts and for the selection of reference lamps.

Moreover, the testing of ballasts requires a clear definition of testing methods. This testing will, in general, be made with reference lamps and, in particular, by comparing results obtained on such lamps with these ballasts and with the reference ballast.

Because of the special characteristics of discharge lamps, two ranges of supply voltage variation had to be considered. Whenever safety is involved, the classical range of variation from 90% to 110% of the rated supply voltage is retained, but for certain clauses where only operational conditions are concerned a smaller range from 92% to 106% of the rated value has been considered.

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Any IEC table, figure or passage of text that is struck through is not part of this Standard. Any Australian/New Zealand table, figure or passage of text that is added (and identified by shading) is part of this Standard.

Section 0: General requirements**1 Scope**

This standard specifies performance requirements for ballasts for discharge lamps such as high-pressure mercury vapour, low-pressure sodium vapour, high-pressure sodium vapour and metal halide lamps. Each section details specific requirements for a particular type of ballast. The standard covers inductive type ballasts for use on a.c. supplies up to 1 000 V at 50 Hz to 60 Hz associated with discharge lamps, having rated wattage, dimensions and characteristics as specified in the relevant IEC lamp standards.

It is to be read in conjunction with IEC 60922.

NOTE 1 – For certain types of discharge lamps an ignitor is required.

NOTE 2 – Extension of the standard to cover ballasts incorporating or for use with series capacitors is under consideration.

NOTE 3 – The performance requirements of ballasts for tubular fluorescent lamps are covered by IEC 60921.

1.1 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

References to International Standards that are struck through in this Clause are replaced by references to equivalent Australian or Australian/New Zealand Standards that are listed immediately thereafter and identified by shading. Any Australian or Australian/New Zealand Standard that is identical to the International Standard it replaces is appropriately identified.

IEC 60188:1974, *High-pressure mercury vapour lamps*

IEC 60192:1973, *Low pressure sodium vapour lamps*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

~~IEC 60555-2:1982, Disturbances in supply systems caused by household appliances and similar electrical equipment – Part 2: Harmonics – Amendment 2 (1988)~~

~~AS/NZS 61000, Electromagnetic compatibility (EMC)~~

~~AS/NZS 61000.3.2, Part 3.2: Limits—Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase)~~

IEC 60662:1980, *High-pressure sodium vapour lamps*

~~IEC 60921:1988, Ballasts for tubular fluorescent lamps – Performance requirements~~

~~AS 2643, Fluorescent lamps ballasts of reactive type – Performance requirements~~

~~IEC 60922:1989, Ballasts for discharge lamps (excluding tubular fluorescent lamps) – general and safety requirements~~

~~AS/NZS 60922, Auxiliaries for lamps – Ballasts for discharge lamps (excluding tubular fluorescent lamps) – General and safety requirements~~

IEC 60926:1990, *Starting devices (other than glow starters) – General and safety requirements*

2 Definitions

The definitions given in IEC 60922 apply.

3 General notes on tests

3.1 Tests according to this specification are type tests.

NOTE – The requirements and tolerances permitted by this standard are based on testing of a type test sample submitted by the manufacturer for that purpose. In principle this type test sample should consist of units having characteristics typical of the manufacturer's production and be as close to the production centre point values as possible. It may be expected with the tolerances given in the standard that products manufactured in accordance with the type test sample will comply with the standard for the majority of the production. Due to the production spread, however, it is inevitable that there will sometimes be ballasts outside the specified tolerances. For guidance of sampling plans and procedures for inspection by attributes, see IEC 60410.

3.2 The tests are carried out in the order of the clauses, unless otherwise specified.

3.3 One sample is submitted to all tests.

3.4 In general all tests are made on each type of ballast or, where a range of similar ballasts is involved, for each rated wattage in the range, or a representative selection from the range, as agreed with the manufacturer.

3.5 Reference ballasts and reference lamps shall be in accordance with annexes A and B.

3.6 The tests are made under the conditions specified in annex C.

3.7 All ballasts specified in this standard shall meet the requirements of IEC 60922.

4 Marking

The following additional marking is included, if appropriate:

4.1 Circuit power-factor, e.g. λ 0,85.

4.2 The symbol "H" which indicates that the ballast is not of the low-distortion type.

5 Ballasts designed to operate at various supply voltages

If a ballast is rated for more than one value of supply voltage, it shall comply with the relevant clauses of this specification at all voltages for which it is marked. In case of a ballast with taps, it is tested using the appropriate tapings.

6 Circuit power-factor

The measured circuit power-factor shall not differ from the marked value by more than 0,05 when the ballast is operated with one or more appropriate lamp(s) and the whole combination is supplied at its rated voltage and frequency.

In cases where a minimum value of the power-factor is required for a high power-factor ballast, it shall be 0,85 measured under the conditions stated above. For these high power-factor ballasts, the measured value shall in no case be less than 0,85.

NOTE – The United States of America requires a power-factor of at least 0,9 for high power-factor ballasts.

7 Supply current

At rated voltage, the supply current shall not differ by more than 10 % from the value marked on the ballast when the latter is operated with a reference lamp.

8 Current waveform

8.1 Supply current waveform

The harmonics of the input current for luminaires are required to comply with IEC 60555-2.

NOTE – The above requirements apply to luminaires or ballasts which are intended to be connected to supplies prescribed in clause 4 of IEC 60555-2.

If the separate tests with reference lamps have proved that ballasts for discharge lamps comply with the requirements as specified in the relevant table of IEC 60555-2, the luminaire is deemed to comply with these requirements and need not be checked. Manufacturers shall indicate whether or not the ballast under test shall be subjected to the following test.

Where these components have not been approved separately or do not comply, the luminaire itself shall be tested and shall comply.

The test is carried out in accordance with the requirements of 8.3.

The ballast shall be operated at its rated voltage with a reference lamp or lamps. After lamp stabilization, the waveform of the supply current shall be such that the harmonics shall not exceed the limits given in the relevant table of IEC 60555-2.