

Specification for

Ballasts for tubular fluorescent lamps — Performance requirements

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British Standard

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This British Standard was published under the authority of the Standards Board and comes into effect on 30 August 1991

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The following BSI references relate to the work on this standard:
Committee reference LGL/21
Draft for comment 86/25168 DC

ISBN 0 580 19971 1

Amendments issued since publication

Amd. No.	Date	Comments
7433	December 1992	
8884	November 1995	Indicated by a sideline in the margin

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National foreword

This British Standard has been prepared by Technical Committee CPL/34/3 and is the English language version of EN 60921:1991 “*Ballasts for tubular fluorescent lamps — Performance requirements*”, and its Amendments 1 and 2, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 921:1988, its corrigendum of April 1989 and its Amendments No. 1:1990 and No. 2:1994 published by the International Electrotechnical Commission (IEC) of the same title.

This standard together with BS EN 60920:1991 supersedes BS 2818-1:1985 which is withdrawn.

The CENELEC common modifications, which are quoted on page 2, have been implemented at the appropriate places in the text of IEC 921 and are indicated by a sideline in the margin.

The foreword and preface of IEC 921 and the deleted parts of the original IEC text, which do not form part of the text of EN 60921, have been quoted in National appendix NA.

Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given for information only. National appendices are designated “informative”.

Cross-references. Details of international standards quoted in this British Standard for which there is an identical or technically equivalent British Standard are given in National appendix NC.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

UDC 621.327.5:621.316.8

Descriptors: Lighting equipment, fluorescent lamp, tubular lamp, reference ballast, marking, construction characteristic, performance characteristic, test

English version

Ballasts for tubular fluorescent lamps Performance requirements

(include amendments A1:1992 + A2:1995)
(IEC 921:1988 + corrigendum April 1989, modified)

Ballasts pour lampes tubulaires à fluorescence
Prescriptions de performances
(Inclut les amendements A1:1992 + A2:1995)
(CEI 921:1988 + corrigendum avril 1989, modifiée)

Vorschaltgeräte für röhrenförmige
Leuchtstofflampen Anforderungen an die
Arbeitsweise
(enthält Änderungen A1:1992 + A2:1995)
(IEC 921:1988 + Corrigendum April 1989, modifiziert)

This European Standard was approved by CENELEC on 15 March 1991. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national, standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. EN 60921:1991 + A1:1992 + A2:1995
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Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 921:1988, as corrected by corrigendum April 1989, could be accepted without textual changes, has shown that some CENELEC common modifications were necessary for the acceptance as European Standard.

The reference document, together with the common modifications prepared by the CENELEC Technical Committee TC 34Z, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as EN 60921 on 15 March 1991.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1992-03-01
- latest date of withdrawal of conflicting national standards (dow) 1992-03-01

For products which have complied with the relevant national standard before 1992-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-03-01.

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

Endorsement notice

The text of the International Standard IEC 921:1988 with its corrigendum April 1989 was approved by CENELEC as a European Standard with agreed common modifications as given below.

Common modifications

- 4.3 Delete.
- 11.1 Delete the second paragraph.
- Replace Table I and the associated note with the following:

Table I — Maximum value of the harmonics

Harmonic	Maximum value expressed as a percentage of fundamental current for the ballast
2	5
3	$30 \times \lambda$
5	7
7	4
9	3
λ id the circuit power-factor.	

13. Delete note 2.

Foreword to Amendment A1

The CENELEC questionnaire procedure, performed for finding out whether or not amendment A1:1990 to the International Standard IEC 921:1988 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as an amendment to the European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as amendment A1 to EN 60921:1988 on 16 June 1992.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1993-06-01
- latest date of withdrawal of conflicting national standards (dow) 1993-06-01

For products which have complied with EN 60921:1991 before 1993-06-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-06-01.

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

Foreword to Amendment A2

The text of amendment 2:1994 to the International Standard IEC 921:1988, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A2 to EN 60921:1991 on 1995-05-15 without any modification.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1996-07-01

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Introduction

This standard covers performance requirements for ballasts for tubular fluorescent lamps. It should be read in conjunction with IEC Publication 920, with which all ballasts covered by the present standard should comply.

Unless otherwise stated on the lamp data sheet mentioned in IEC Publications 81 and 901, it may be expected that ballasts which comply with this standard, when associated with lamps complying with IEC Publications 81 or 901, and, where appropriate, operated with a starter complying with IEC Publication 155 or starting devices complying with IEC Publication 927, will ensure satisfactory starting of the lamps at an air temperature immediately around the lamps between 10 °C and 35 °C and for voltages between 92 % and 106 % of rated supply voltage, and also proper operation between 10 °C and 50 °C at rated supply voltage.

The compatibility of lamps and ballasts is evaluated with the use of special inductive ballasts called “reference ballasts” having particular characteristics which are stable and reproducible. These ballasts are used when testing commercial ballasts and when selecting reference lamps. Moreover, the testing of ballasts presents particular difficulties which require a proper definition of testing methods. Such tests will generally be made with reference lamps and, in particular, by comparing the results obtained when such lamps are operated on a reference ballast with the results obtained when the same lamps are operated on the ballast being tested.

NOTE Requirements are also included for all those features of reference ballast construction and performance which are considered necessary to ensure accurate and reproducible results when testing ballasts, particularly with regard to the selection of reference lamps.

For checking the lamp power and current of lamps operated without starter, this standard specifies a measurement in a reference ballast circuit that makes no provision for separate power sources to heat the cathodes during lamp operation. Although the influence on the ballast specification is small, it has nevertheless been deemed useful for some pre-heated low-voltage cathode lamps, operated without a starter, to include provision for two alternative methods of measurement of lamp power and current:

- a) measurement of lamp power and current without additional cathode heating;
- b) measurement of lamp power and current with additional cathode heating.

The test method to be adopted for appraisal should be stated by the manufacturer.

Two alternative circuits are specified for the measurement of impedance at audio-frequencies. The less complex circuit could be used when there is no doubt about the inductive character of the impedance. If there is any doubt, the other circuit shall be used.

1 Scope

This standard specifies performance requirements for ballasts excluding resistance types for use on a.c. supplies up to 1 000 V at 50 Hz or 60 Hz, associated with tubular fluorescent lamps with pre-heated cathodes operated with or without a starter or starting device and having rated wattages, dimensions and characteristics as specified in IEC Publications 81 and 901. It applies to complete ballasts and their component parts such as resistors, transformers and capacitors.

NOTE Full implications of references to IEC Publication 901 have not been carried out in this standard.

This standard should be read in conjunction with IEC Publication 920. A.C. supplied electronic ballasts for tubular fluorescent lamps for high frequency operation specified in IEC Publication 928 are excluded.

2 Definitions

The definitions of IEC Publication 920 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, it is inevitable, however, that there may sometimes be ballasts outside the specified tolerances.

For guidance of sampling plans and procedures for inspection by attributes, see IEC Publication 410.

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

3.3 One specimen shall be 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 on a representative selection from the range as agreed with the manufacturer.

3.5 The tests shall be made under the conditions specified in Appendix A.