

Specification for

Low pressure sodium vapour lamps

The European Standard EN 60192:1993 has the status of a
British Standard

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Amendments issued since publication

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National foreword

This British Standard has been prepared by Technical Committee CPL/34/1 and is the English language version of EN 60192:1993, *Low pressure sodium vapour lamps*, and its amendments A4:1995 and A5:1995 published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 192:1973 plus Amendment Nos. 1 to 5 published by the International Electrotechnical Commission (IEC).

The forewords to amendments A4:1995 and A5:1995 make reference to “date of withdrawal (dow) of conflicting national standards” as 1995-10-01. In this case the relevant national standard is BS EN 60192 but the date of withdrawal relates only to those parts of the British Standard subject to amendments A4 and A5. Certificates and marks will not be awarded after this date with respect to the British Standard not incorporating amendments A4 and A5. They will be awarded only to the amended British Standard. However, such certificates and marks already awarded with respect to the British Standard not incorporating Amendments A4 and A5 may continue to apply for production until 2000-10-01. BS EN 60192 supersedes BS 3767:1990, which is withdrawn.

This standard is supplied in looseleaf form. Amendments containing new or revised standard sheets will be issued in future to ensure that this standard is kept up to date.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 36, 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.

English version

Low pressure sodium vapour lamps

(includes amendments A4 + A5:1995)

(IEC 192:1973 + A1:1979 + A2:1988 + A3:1992)

Lampes à vapeur de sodium à basse pression

(inclut les amendements A4 + A5:1995)

(CEI 192:1973 + A1:1979 + A2:1988 + A3:1992)

Natriumdampf-Niederdrucklampen

(enthält Änderungen A4 + A5:1995)

(IEC 192:1973 + A1:1979 + A2:1988 + A3:1992)

This European Standard was approved by CENELEC on 1993-07-06. 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 Versions 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization

Comité Européen de Normalisation Electrotechnique

Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 192:1973 and its amendments 1:1979, 2:1988 and 3:1992, could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60192 on 6 July 1993.

This European Standard replaces HD 219 S3:1990.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-03-01
- latest date of withdrawal of conflicting national standards (dow) 1994-03-01

For products which have complied with HD 219 S3:1990 before 1994-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-03-01.

Foreword to amendment A4

The text of amendment 4:1993 to the International Standard IEC 192:1973, prepared by SC 34A, Lamps, of IEC TC 34, Lamps and related equipment, was submitted to the formal vote and was approved by CENELEC as amendment A4 to EN 60192:1993 on 1994-12-06 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) 1995-11-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1995-11-01

For products which have complied with EN 60192:1993 before 1995-11-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-11-01.

Foreword to amendment A5

The text of document 34A (CO) 697, future amendment 5 to IEC 192:1973, prepared by SC 34A, Lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A5 to EN 60192:1993 on 1994-07-05.

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) 1995-11-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1995-11-01

For products which have complied with EN 60192:1993 before 1995-11-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-11-01.

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Section I. Test requirements

1 Scope

These recommendations state the methods of test to be used for determining the characteristics of low pressure sodium vapour lamps of the integral type, both U-shaped and linear, operating on a.c. mains, 50 Hz or 60 Hz, with a ballast satisfying the requirements of IEC Publication 459: Ballasts for Low Pressure Sodium Vapour Lamps. The recommendations relate only to type testing.

2 Definitions

For the definitions of general terms used in these recommendations, reference should be made to Chapter 845: Lighting, of the International Electrotechnical Vocabulary (See IEC Publication 50 (845).

For the purpose of this publication, the following definitions shall apply:

2.1

rated wattage

the wattage marked on the lamp

2.2

lamp starting voltage

the lowest r.m.s. voltage at the lamp terminals at or below which the lamp starts

2.3

initial readings

the photometric and electrical measurements made at the end of the ageing period (lamp starting is checked prior to the ageing period)

2.4

rated luminous flux

the luminous flux expressed in lumens, declared by the manufacturer or the responsible seller

2.5

reference ballast

a special inductive type ballast designed for use a) in testing lamps, b) as a comparison standard for testing ballasts, and c) in the selection of reference lamps. It is essentially characterized by a stable voltage/current ratio which is relatively uninfluenced by variations in current, temperature and magnetic surroundings

2.6

calibration current

the value of the current on which the calibration and control of the reference ballast are based

2.7

type test

a test or a series of tests, made on a type test sample, for the purpose of checking compliance of the design of a given product with the requirements of the relevant specification

2.8

type test sample

a sample consisting of one or more similar units submitted by the manufacturer or the responsible vendor for the purpose of a type test

2.9

lamp designation: Type E

code, indicating economy, given on the lamp data sheet to designate a type of low pressure sodium vapour lamp with improved luminous efficacy

NOTE As these lamps may be operated on various ballasts with slightly different wattages, it is not satisfactory to mark them with a rated wattage. A lamp designation has been chosen consisting of the letter E and a number approximately numerically equal to the rated wattage. In order to avoid confusion with the existing lamps marked with the rated wattage, the number in the designation is different from that of the rated wattage.

3 Marking

The following information shall be distinctly and durably marked on the lamp:

- a) Mark of origin. This may take the form of a trade mark, the manufacturer's identification mark or the name of the responsible seller.
- b) Rated wattage or lamp designation as given in standard data sheets.

4 Lamp dimensions

The lamp dimensions shall comply with the requirements given on the relevant lamp data sheet in Section II of this publication.

5 Caps

- a) The cap on the completed lamp shall comply with IEC Publication 61: Lamp Caps and Holders together with Gauges for the Control of Interchangeability and Safety.
- b) The cap shall be so constructed and attached to the bulb that it will withstand the torque given below. The torque shall be applied using the appropriate special lampholder detailed in Appendix A and shall not be applied suddenly but increased continuously from zero to the amount specified.

Cap	Torque
BY22d	3.0 newton metres

6 Starting test

The test shall be made before ageing. The lamp shall start within 10 seconds and remain alight for at least one minute, when tested as specified in Appendix B.

7 Electrical and luminous characteristics

7.1 Position of operation

The lamp shall be operated within $\pm 5^\circ$ of the horizontal position.

7.2 Ageing

Before the initial readings are taken, the lamp shall be aged for 100 hours using the circuit shown in Figure 3, page 8, Appendix B. The supply voltage shall not vary by more than $\pm 10\%$ and the frequency by not more than ± 1 Hz.

7.3 Lamp voltage and wattage

- a) The voltage at the lamp terminals using the test conditions in Appendix C shall be within the limits specified in the relevant lamp data sheet.
- b) The wattage dissipated by the lamp using the test conditions in Appendix C shall not exceed the maximum wattage specified in the relevant lamp data sheet.

7.4 Luminous flux

The luminous flux of individual lamps shall be not less than 90 % of the rated value using the test conditions in Appendix C.

b) the following condition:

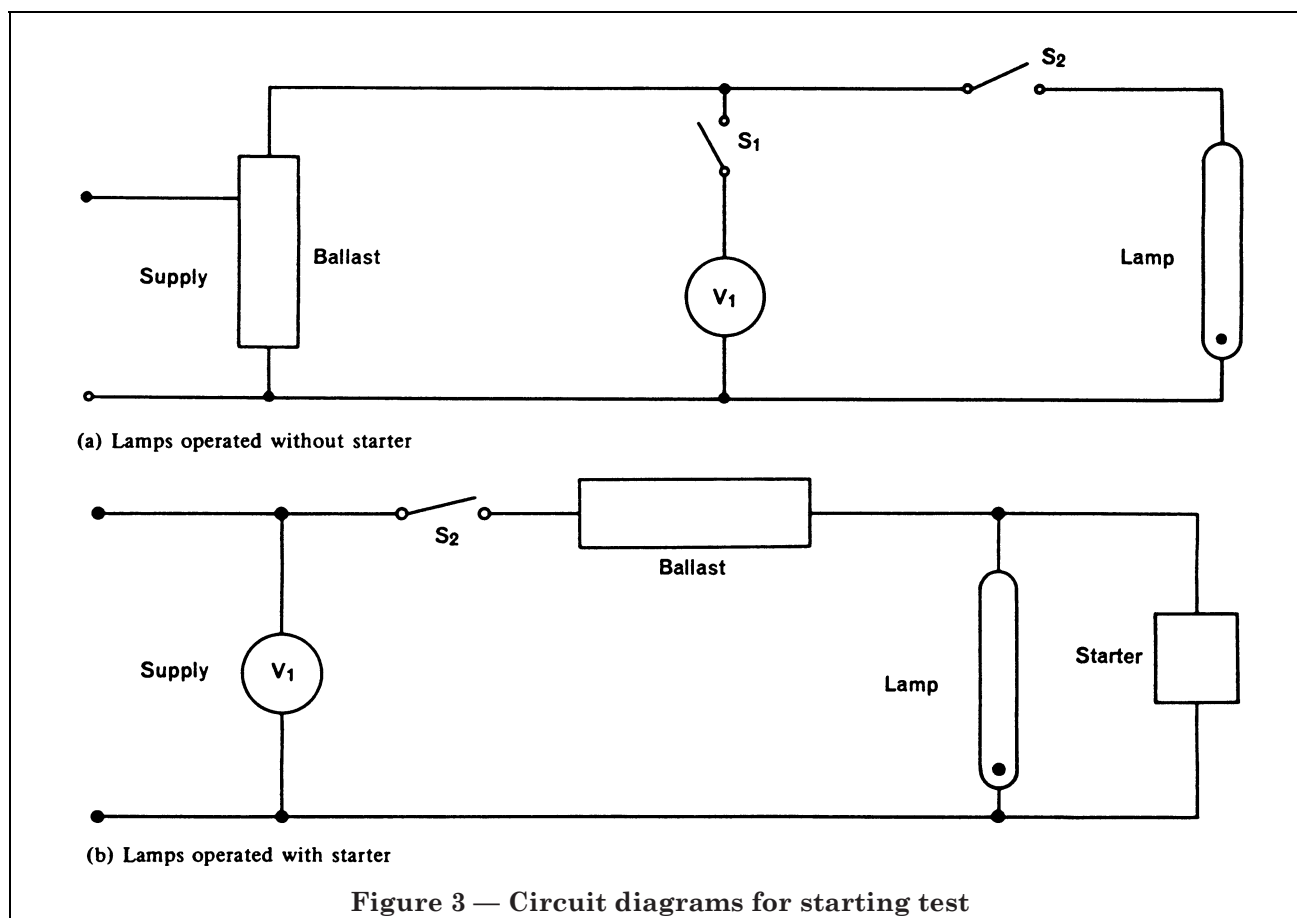
The total harmonic content of the open-circuit voltage shall not exceed 3 %, the harmonic content being defined as the root-mean-square (r.m.s.) summation of the individual harmonic components, using the fundamental as 100 %.

B.1.4 The lamp shall be at sufficient distance from any earthed metal or starting aid.

B.2 Starting test

The voltage V_1 shall be set to the starting voltage given in the relevant lamp data sheet, and switch S_2 closed.

NOTE For lamps operating with starter, the starting test voltage shall be specified by the manufacturer of the lamp.



Appendix C Methods of measuring electrical and luminous characteristics of the lamp

C.1 General

C.1.1 The ballasts used for these tests shall be reference ballasts having a voltage-to-current ratio as specified in the relevant lamp data sheets, and meeting the general requirements for reference ballasts given in IEC Publication 459.

C.1.2 Lamps shall be tested in a circuit using a nominal 50 Hz or 60 Hz supply as appropriate at an ambient temperature of between 20 °C and 30 °C using the circuit shown in Figure 4.

C.2 Supply

C.2.1 The frequency shall be that for which the ballast is designed with a tolerance of ± 0.5 %.

C.2.2 The voltage at the supply terminals shall be adjusted to the rated value of the ballast used.

C.2.3 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 %.

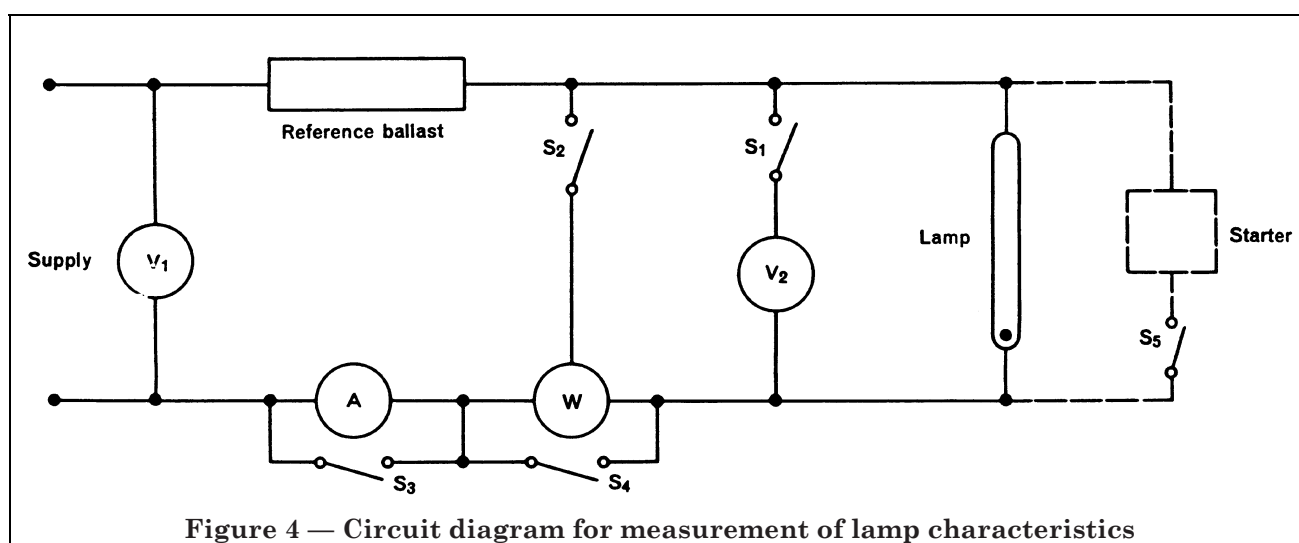
NOTE This implies that the source of supply shall have sufficient power, and that the supply circuit shall have a sufficiently low impedance compared with the ballast impedance, and care should be taken that this applies under all conditions that occur during the measurement.

C.2.4 During the period of stabilization, the supply voltage and frequency should be stable within ± 0.5 %, this tolerance being reduced to ± 0.2 % at the moment of measurement.

C.3 Instruments and measurements

C.3.1 The lamp shall be operated until the electrical and luminous characteristics are stable before any final readings on the lamp are taken.

C.3.2 Instruments shall have a class index²⁾ appropriate to the requirements.



²⁾ IEC Publication 51: Direct acting indicating analogue electrical measuring instruments and their accessories.