

**SLOVENSKI
STANDARD**

SIST EN 60192:1995

prva izdaja
december 1995

Low pressure sodium vapour lamps (IEC 192:1973 + A1:1979 + A2:1988 + A3:1992)

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EUROPEAN STANDARD

EN 60192

NORME EUROPEENNE

EUROPÄISCHE NORM

July 1993

UDC 621.327.532.1

Supersedes HD 219 S3:1990

Descriptors: Lighting equipment, sodium vapour lamp, test, characteristic

ENGLISH VERSION

Low pressure sodium vapour lamps
(IEC 192:1973 + A1:1979 + A2:1988 + A3:1992)

Lampes à vapeur de sodium
à basse pression

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

Natriumdampf-Niederdrucklampen

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

iTeh STANDARD PREVIEW

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 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.

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

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Ref. No. EN 60192:1993 E

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.

SIST EN 60192:1995

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ENDORSEMENT NOTICE

The text of the International Standard IEC 192:1973 and its amendments 1:1979, 2:1988 and 3:1992 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC	<u>Publication</u>	<u>Date</u>	<u>Title</u>	<u>EN/HD</u>	<u>Date</u>
50(845)	1987		International Electrotechnical Vocabulary - Chapter 845: Lighting	-	-
51	Series		Direct acting indicating analogue electrical measuring instruments and their accessories	EN 60051	Series
61	Series		Lamp caps and holders together with gauges for the control of interchangeability and safety	EN 60061	Series
459	1974		Ballasts for low-pressure sodium vapour lamps	-	-

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

(affiliée à l'Organisation Internationale de Normalisation — ISO)

RECOMMANDATION DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION

(affiliated to the International Organization for Standardization — ISO)

IEC RECOMMENDATION

Publication 192

Deuxième édition — Second edition

1973

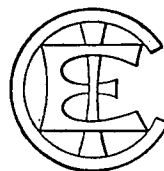
Lampes à vapeur de sodium à basse pression

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Low pressure sodium vapour lamps

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CONTENTS

	Page
FOREWORD	5
PREFACE	5
SECTION I – TEST AND COMPLIANCE REQUIREMENTS FOR LOW PRESSURE SODIUM VAPOUR LAMPS	
Clause	
1. Scope	7
2. Definitions	7
3. Marking	9
4. Lamp dimensions	9
5. Caps	9
6. Starting tests	9
7. Requirements and conditions of test for electrical and luminous characteristics	9
APPENDIX A. Torsion test holder	11
https://standards.iteh.ai/catalog/standards/sist/ace337e4-37d4-4754-82d7-32c171417730/sist-en-60192-1995	
APPENDIX B. Starting test	15
APPENDIX C. Methods of measuring electrical and luminous characteristics of the lamp	17
FIGURE 1. Torsion test holder for lamps with bayonet cap BY22d	11
FIGURE 2. Torsion test holder for lamps with bi-pin cap G13	13
FIGURE 3. Circuit diagrams for starting test	15
FIGURE 4. Circuit diagram for measurement of lamp characteristics	17
SECTION II – STANDARD DATA SHEETS FOR LOW PRESSURE SODIUM VAPOUR LAMPS	
8. General principles of numbering sheets	19
9. List of specific lamp types	19
DATA SHEETS	22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW PRESSURE SODIUM VAPOUR LAMPS

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendations and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This recommendation was prepared by Sub-Committee 34A, Lamps, of Technical Committee No. 34, Lamps and Related Equipment.

Draft proposals for the recommendation were prepared by the Expert's Working Group (PRESCO) and as the result of the meeting held in London in 1968, a draft was submitted to the National Committees for approval under the Six Months' Rule in April 1970.

The following countries voted explicitly in favour of publication:

Australia	Italy
Austria	Japan
Belgium	Netherlands
Canada	South Africa
Czechoslovakia	Sweden
Denmark	Switzerland
Finland	Turkey
France	Union of Soviet
Germany	Socialist Republics
Hungary	United Kingdom
Iran	Yugoslavia
Israel	

LOW PRESSURE SODIUM VAPOUR LAMPS

SECTION I – TEST AND COMPLIANCE REQUIREMENTS
FOR LOW PRESSURE SODIUM VAPOUR LAMPS

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, Recommendations for Ballasts for Low Pressure Sodium Lamps (in course of preparation).

2. Definitions

For the definitions of general terms used in these recommendations, reference should be made to Group 45, Lighting, of the International Electrotechnical Vocabulary (See IEC Publication 50 (45)). 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.

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.

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
G13 and G13 (spec.)	1.2 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. **Requirements and conditions of test for electrical and luminous characteristics**7.1 *Position of operation during ageing and tests*

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 15, 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.

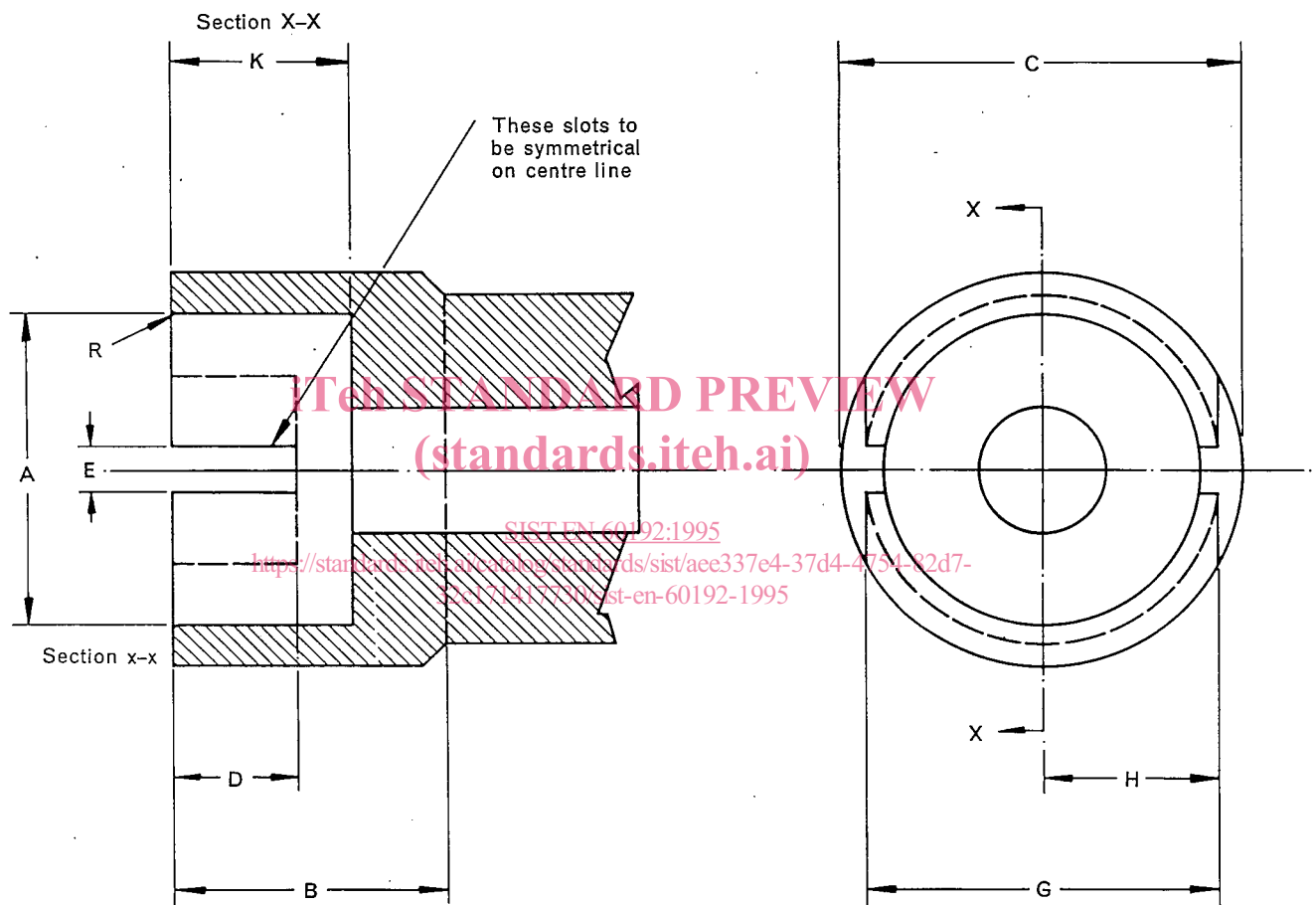
7.4 *Luminous flux*

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

APPENDIX A

TORSION TEST HOLDER FOR LAMPS WITH BAYONET CAP BY22d*

FIGURE 1



Dimensions in mm

A	B	C	D	E	G	H	K	R
22.27 +0.03	19.0 min.	28.0 min.	9.5 min.	3.0 +0.2	24.6 +0.3	12.15 min.	12.7 +0.3	1.5 approx.

* This is the standard torsion test holder for lamps with B22 caps.

APPENDIX B

STARTING TEST

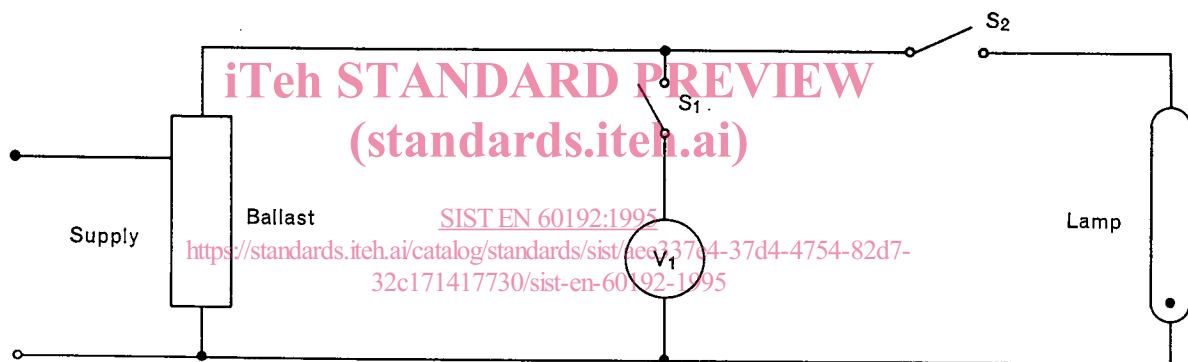
B1. General

- B1.1 Lamps shall not be operated during the five hours immediately prior to making this test.
- B1.2 They shall be tested using a nominal 50 Hz or 60 Hz supply (in an ambient temperature between 20 °C and 30 °C) using the circuits shown in Figure 3.
- B1.3 The ballast shall satisfy the requirements of IEC Publication, Recommendations for Ballasts for Low Pressure Sodium Lamps (in course of preparation).
- B1.4 The lamp shall be at sufficient distance from any earthed metal or starting aid.

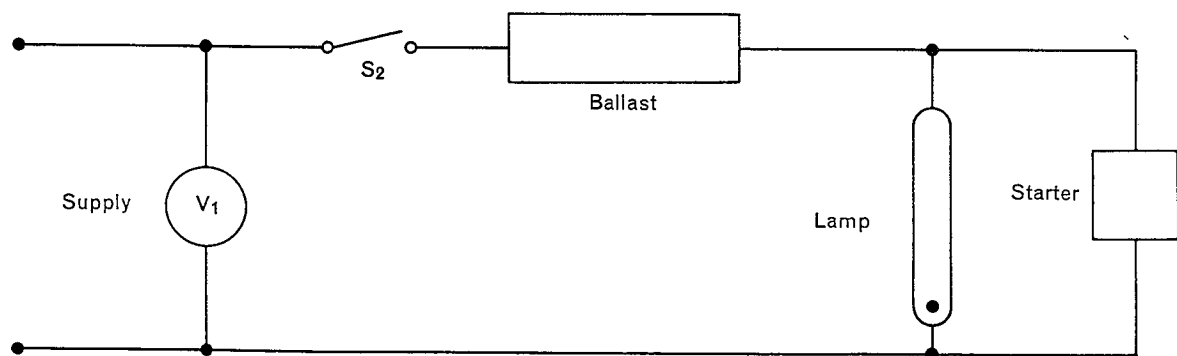
B2. Starting test

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.



(a) Lamps operated without starter



(b) Lamps operated with starter

FIG. 3. – Circuit diagrams for starting test.

APPENDIX C

METHODS OF MEASURING ELECTRICAL AND LUMINOUS CHARACTERISTICS OF THE LAMP

C1. General

C1.1 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, Recommendations for Ballasts for Low Pressure Sodium Lamps (in course of preparation).

C1.2 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.

C2. Supply

C2.1 The frequency shall be that for which the ballast is designed with a tolerance of $\pm 0.5\%$.

C2.2 The voltage at the supply terminals shall be adjusted to the rated value of the ballast used.

C2.3 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.

C2.4 During the period of stabilization the supply voltage and frequency should be stable within $\pm 0.5\%$, this tolerance being reduced to $\pm 0.2\%$ at the moment of measurement.

C3. Instruments and measurements

C3.1 The lamp shall be operated until the electrical and luminous characteristics are stable before any final readings on the lamp are taken.

C3.2 Instruments shall have a class index* appropriate to the requirements.

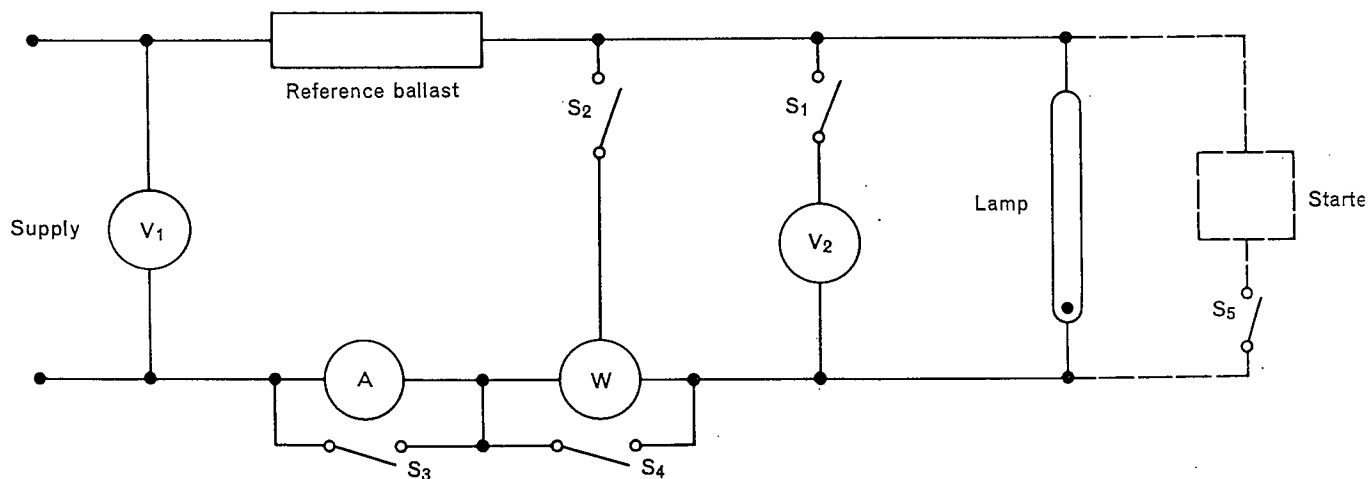


FIG. 4. - Circuit diagram for measurement of lamp characteristics.

* IEC Publication 51: Recommendations for Indicating Electrical Measuring Instruments and their Accessories.

SECTION II – STANDARD DATA SHEETS
FOR LOW PRESSURE SODIUM VAPOUR LAMPS

8. General principles of numbering sheets

The standard sheets are numbered as follows: 192 – 10 – 1; 192 – 20 – 1; 192 – 30 – 1, etc.

The first number is the number of this recommendation. The second number is the number of the sheet allocated in order of publication of the sheets. The third number is the number of the issue of the sheet, i.e., 1 – first issue, 2 – second issue, etc.

9. List of specific lamp types

Wattage (W)	Cap	Arc tube	Sheet No.
35	BY22d	“U” shaped	192 – 10 – 1
55	BY22d	“U” shaped	192 – 20 – 1
90	BY22d	“U” shaped	192 – 30 – 1
135	BY22d	“U” shaped	192 – 40 – 1
180	BY22d	“U” shaped	192 – 50 – 1
60	G13	Linear	192 – 60 – 1
140	G13	Linear	192 – 70 – 1
200 (902 mm)	G13 } Special	Linear	192 – 80 – 1
200 (1 207 mm)*	G13	Linear	192 – 90 – 1

* Starter switch operated lamp.

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