

Specification for

High-pressure mercury vapour lamps

The European Standard EN 60188 has the status of a
British Standard

UDC 621.327.534.2:620.1

Cooperating organizations

The European Committee for Electrotechnical Standardization (CENELEC), under whose supervision this European Standard was prepared, comprises the National Committees of the following countries.

Austria	Luxemburg
Belgium	Netherlands
Denmark	Norway
Finland	Portugal
France	Spain
Germany	Sweden
Greece	Switzerland
Ireland	United Kingdom
Italy	

This British Standard, having been prepared under the direction of the Electrical Illumination Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1989

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First published November 1963
First revision July 1974
Second revision July 1982
Third revision February 1989

The following BSI references relate to the work on this standard:
Committee reference LGL/6
Draft for comment 85/21085 DC

ISBN 0 580 17097 7

Amendments issued since publication

Amd. No.	Date of issue	Comments
6714	June 1991	
8048	January 1994	Indicated by a sideline in the margin

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National foreword

This British Standard has been prepared under the direction of the Electrical Illumination Standards Policy Committee and is the English language version of EN 60188 and its Amendments 1 and A5 which consist of IEC 188:1974, *High-pressure mercury vapour lamps*, and Amendments No. 1, No. 2, No. 3 (modified), No. 4 (modified) and No. 5 (modified) published by the International Electrotechnical Commission (IEC).

This British Standard is supplied in the form of separate standard sheets within a loose-leaf folder. Amendments containing new or revised standard sheets will be issued in the future to ensure that this standard is kept up to date.

Attention is drawn to the fact that the numbering system used on the lamp data sheets is derived from the IEC publication number (see clause 8).

On the lamp data sheets, the reference to the French text overleaf is inapplicable. For ease of reproduction, the French text in the maximum lamp outline sheets has been retained.

National appendix W lists the United Kingdom cooperating organizations involved in the production of this standard.

Cross-references. Details of other international publications quoted in this standard are given in Appendix E. Where there are British Standards either identical or related to these International Standards the relationship is given in Appendix X.

Additional information. On page 2 of the text of EN 60188 under the title “Technical text”, abbreviations *doa*, *dolp* and *dow* are given. These represent “date of announcement at national level that the EN exists”, “date of latest publication of the corresponding harmonized national standard” and “date of withdrawal of conflicting requirements in national standards”. These dates have been set by the CENELEC Technical Board.

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 56, 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.

High-pressure mercury vapour lamps

(includes amendments A1:1990 + A5:1993)

[IEC 188 (1974 – 2nd edition
+ Amendment No 1 (1976) + Amendment No 2 (1979)
+ Amendment No 3 (1984), modified)]

Lampes à décharge à vapeur de mercure à
haute pression [CEI 188 (1974 – 2ème édition
+ Modification no 1 (1976) + Modification no 2
(1979) + Modification no 3 (1984), modifiée)]
(inclut les amendements A1:1990 + A5:1993)

Quecksilberdampf-Hochdrucklampen
[IEC 188 (1974 – 2. Ausgabe + Änderung
Nr. 1 (1976) + Änderung Nr. 2 (1979)
+ Änderung Nr. 3 (1984), modifiziert)]
(enthält Änderungen A1:1990 + A5:1993)

This European Standard was ratified by CENELEC on 10 September 1986. CENELEC members are bound to comply with the requirements of the 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 CENELEC Central Secretariat or to any CENELEC member.

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

Brief history

The CENELEC Questionnaire Procedure performed for finding out whether or not IEC 188 (2nd edition, 1974) including Amendment No. 1 (1976), Amendment No. 2 (1979) and Amendment No. 3 (1984) could be accepted without textual changes, has shown that one common modification was necessary for the acceptance as European Standard (EN). The Reference Document was submitted to the CENELEC members for vote and acceptance by CENELEC.

Technical text

The text of the International Standard IEC 188 (2nd edition, 1974) including Amendment No. 1 (1976), Amendment No. 2 (1979) and Amendment No. 3 (1984), was approved by CENELEC on 10 September 1986 as a European Standard with one agreed CENELEC common modification, which is applicable in several places in the text of IEC 188 (1974). This modification deletes all references to lamps with E26 and E39 caps and for the sake of clarity, every place where this deletion has been made is marked by a vertical line in the left-hand margin. In addition, data sheets 188-IEC-3-7A-1 and 188-IEC-3-8A-1 have been entirely deleted since they refer exclusively to E39 caps. Editorial CENELEC common modifications to IEC Publication became necessary for the European Standard; they are also marked by a vertical line in the left-hand margin.

The following dates were fixed:

doa: 1987-03-15
dolph/dow: 1988-03-15

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

In this European Standard, Appendix A to Appendix D from the Reference Document are normative and also Appendix E added by CENELEC.

Foreword to Amendment A1

The proposal to endorse Amendment 4 to IEC 188:1974 was circulated under the CENELEC Questionnaire Procedure. The reference document was submitted to the CENELEC members for formal vote.

At the time of ratification, it became evident that a common modification was required, deleting all references to E26 and E39 caps, to be consistent with other previously approved European Standards.

The text of the draft was approved by CENELEC as Amendment 1 to EN 60188:1988 on 11 June 1990.

NOTE Amendments 1, 2 and 3 to IEC 188:1974 were already endorsed by EN 60188:1988.

The following dates were fixed:

- latest date of announcement of the amendment at national level (doa) 1990-12-15
- latest date of publication of an identical amendment to the national standard (dop) 1991-06-15
- latest date of withdrawal of conflicting national standards (dow) 1991-06-15

For products which have complied with EN 60188:1988 before 1991-06-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1996-06-15.

In the consolidated text of the amendment, the common modifications are indicated by a vertical line in the left margin.

Endorsement notice

The text of Amendment 4 to the International Standard IEC 188:1974 was approved by CENELEC as an amendment to the European Standard with agreed common modifications as given as below:

Common modifications

Delete all references to E26 and E39 caps in clause 9 and in all of the data sheets in this document.

Foreword to Amendment A2

The CENELEC questionnaire procedure, performed for finding out whether or not amendment 5:1991 to the International Standard IEC 188:1974 could be accepted without textual changes, has shown that some common modifications were necessary for the acceptance as a European Standard.

The reference document, together with the common modifications prepared by Reporting Secretariat SR 34A, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as amendment A5 to EN 60188 on 6 July 1993.

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 EN 60188:1988 and its amendment A4:1990 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.

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High-pressure mercury vapour lamps

INFORMATION as to original IEC text:
The Foreword of IEC Publication 188 (1974) is not part of this European Standard. It reads:

- 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.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

Preface of IEC publication 188 (1974)
This standard has been prepared by Sub-Committee 34A: Lamps, of IEC Technical Committee No. 34, Lamps and Related Equipment. Draft proposals for this standard were prepared by the Experts' Working Group (PRESCO) and as a result of the meetings held in London in 1968 and in Washington in 1970, drafts, Documents 34A(Central Office)57 and 34A(Central Office)70, were submitted to the National Committees for approval under the Six Months' Rule in February 1970 and in May 1971. Amendments, Document 34A(Central Office)73, were submitted to the National Committees for approval under the Two Months' Procedure in June 1971.

The following countries voted explicitly in favour of publication:

Australia	Netherlands
Austria	Poland
Canada	Portugal
Czechoslovakia	Sweden
Denmark	Switzerland
Finland	Turkey
France	Union of Soviet
Germany	Socialist Republics
Italy	United Kingdom
Japan	Yugoslavia
Korea (Republic of)	

Section 1. Test requirements

1 Scope

These recommendations state the methods of test to be used for determining the characteristics of high-pressure mercury vapour lamps with or without a red correcting fluorescent coating, operating on a.c. mains with a ballast satisfying the requirements of IEC Publication 262: Ballasts for High Pressure Mercury Vapour Lamps. These requirements relate only to type testing.

Details of maximum lamp outlines are also included for guidance in luminaire design.

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 r.m.s. voltage at the lamp terminals at which the lamp starts

2.3

minimum open circuit voltage for stable operation

the minimum open circuit voltage to be provided by an inductive ballast for stable operation of the lamp

2.4

initial readings

the photometric and electrical measurements, made at the end of the ageing period

2.5

red ratio

the ratio of the luminous flux emitted by the lamp in the red portion of the visible spectrum to the total luminous emission of the lamp

for the purpose of this recommendation, the red portion is defined by the part of the visible spectrum comprising the wavelengths above 600 nm

2.6

rated luminous flux

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

2.7

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

2.8

lamp neck length

the distance measured parallel to the lamp axis between the bottom of the cap contact and that point on the lamp bulb where the diameter is 2 mm greater than the maximum neck diameter

2.9

calibration current

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

2.10

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

2.11

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

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 sheet.

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.

NOTE In some countries, 50 W, 80 W and 125 W lamps or corresponding replacement types may be required with E27/30 caps, in order to ensure contact-making in certain non-standard E27 lampholders. The use of these caps is deprecated and lamps so fitted should include the following warning either on, or inserted in, the individual packing:

"Do not touch the lamp cap when inserting the lamp into, or removing the lamp from, the lampholder."

This warning should also be included in a catalogue which refers to these E27/30-capped lamps.

The following countries have indicated that they do not wish to retain lamps with E27/30 caps.

- Finland
- Sweden
- France
- USA
- Poland
- UK
- South Africa

- b) The cap shall be so constructed and attached to the bulb that it will withstand the torsion test specified in Appendix A.

6 Starting and warm-up characteristics

Before ageing, lamp starting and warm-up characteristics shall be checked as specified in Appendix B.

NOTE Normally it should be expected that at 100 % of the rated supply voltage, lamps will start satisfactorily at temperatures down to -18°C .

7 Electrical and luminous characteristics

7.1 Position of operation

The lamp shall operate in a vertical, cap up position.

7.2 Ageing

Before the initial readings are taken the lamp shall be aged for 100 h using the circuit and relevant requirements as specified in Appendix B. The supply voltage shall not vary by more than $\pm 10\%$ ¹⁾ and the frequency by not more than $\pm 1\text{ Hz}$.

¹⁾ This is to avoid the necessity of having a stabilized voltage and to permit the use of a normal mains supply.

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 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 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.

7.5 Red ratio (fluorescent coated lamps only)

The red ratio shall be not less than 00 % (value under consideration), using the test conditions in Appendix D.

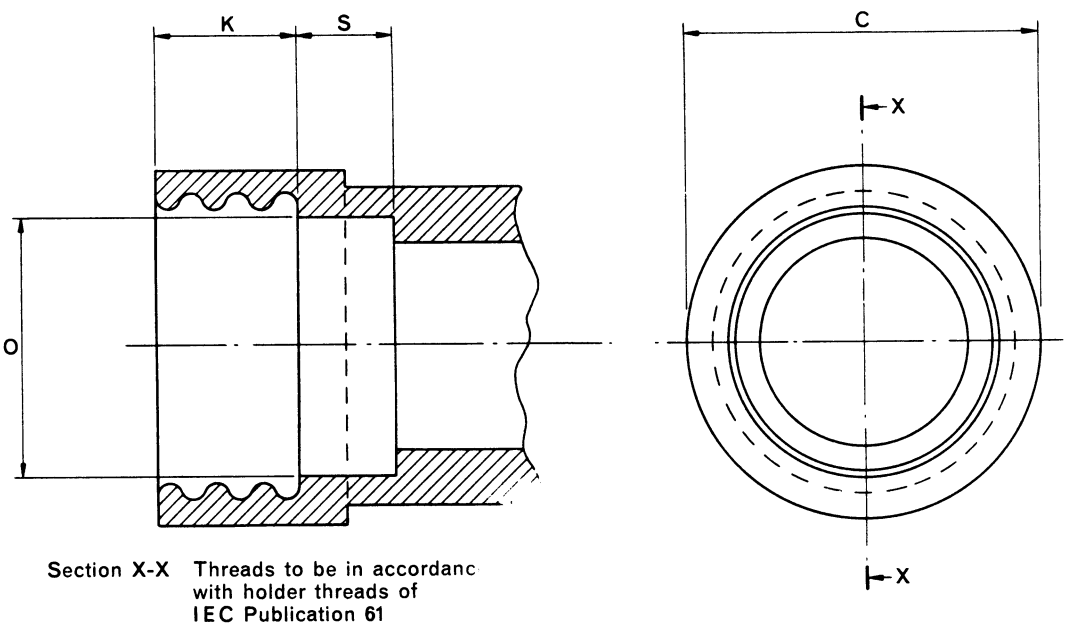
7.6 Lamp stability with rapidly reduced supply voltage

Lamps shall not extinguish if the supply voltage falls from 100 % to 90 % of the rated voltage in not more than 0.5 s and remains at that value for at least 5 s.

Appendix A Torsion test
Torsion test holder for screw caps E27 and E40

The torsion test shall be carried out using the special lampholders shown in Figure 1 and with the following values of torque gradually applied:

- E27 3.0 Nm
- E40 5.0 Nm



(Dimensions in mm)

Dimension	E27	E40	Tolerance
C	32.0	47.0	Minimum
K	11.0	19.0	± 0.3
O	23.0	34.0	± 0.1
S	12.0	13.0	Minimum

Figure 1

Appendix B Starting and warm-up tests
1 General

- 1.1 Lamps shall not be operated during the 5 h immediately prior to making this test.
- 1.2 They shall be tested and aged using a nominal 50 Hz or 60 Hz supply (in an ambient temperature between 20 °C and 30 °C) using the circuit shown in Figure 2.
- 1.3 The ballast shall be of the inductive type and shall satisfy the requirements of IEC Publication 262: Ballasts for High Pressure Mercury Vapour Lamps.
- 1.4 During these tests, lamps shall be operated in a vertical, cap up position.

2 Starting test

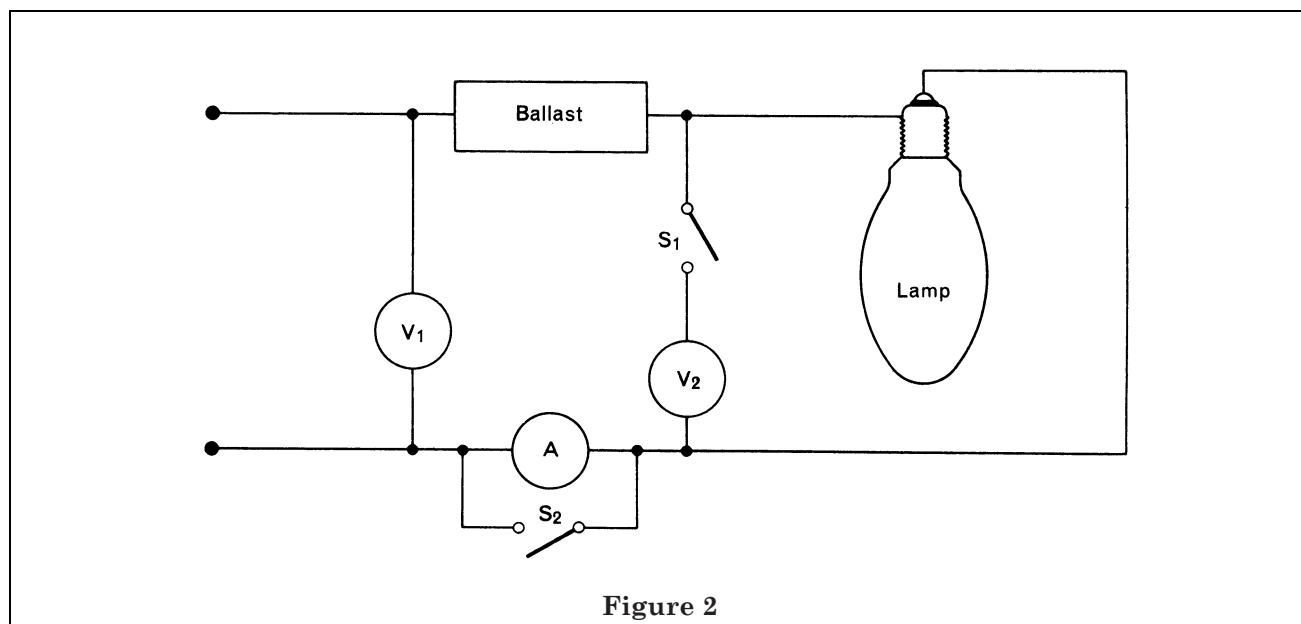
- 2.1 The voltage V_1 shall be set to the starting voltage given in the relevant lamp sheet.
- 2.2 The voltmeter V_2 shall be open-circuited using switch S_1 .
- 2.3 The ammeter shall be short-circuited, using switch S_2 .

3 Warm-up test

3.1 Immediately after starting, the supply voltage shall be adjusted to maintain the warm-up lamp current specified in the relevant lamp sheet.

3.2 The supply voltage shall be varied during the warm-up time to maintain this current constant.

3.3 The test shall be considered satisfactory if the minimum warm-up voltage at lamp terminals is achieved within the time specified in the relevant lamp sheet.



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

1 General

1.1 Ballasts used for these tests shall be reference ballasts having a voltage-to-current ratio and power factor as specified in the relevant lamp sheets and meeting the general requirements for reference ballasts given in IEC Publication 262, Ballasts for High Pressure Mercury Vapour Lamps.

1.2 Lamps shall be tested in a circuit as shown in Figure 3 using a nominal 50 Hz or 60 Hz supply as appropriate, at an ambient temperature of between 20 °C and 30 °C.

2 Supply

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

2.2 The voltage at the supply terminals is adjusted to the rated value of the reference ballast used.

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.

2.4 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.

3 Instruments and measurements

3.1 Potential circuits of instruments connected across a lamp shall take not more than 3 % of the objective lamp current.

3.2 Instruments connected in series with the lamp shall have a sufficiently low impedance such that the voltage drop shall not exceed 2 % of the objective lamp voltage.

3.3 Instruments shall be of a precision appropriate to the requirements and essentially free from wave-form errors.

3.4 When measuring lamp voltage, the wattmeter potential circuit shall be open and the wattmeter current coil shall be short-circuited.

3.5 When measuring lamp power, the lamp voltmeter circuit shall be open and the ammeter shall be short-circuited. No correction shall be made for the power consumed by the wattmeter potential coil as the potential coil is connected on the lamp side of the current coil.

3.6 When measuring luminous flux, the potential circuits of the voltmeter V, and the wattmeter shall be open and the ammeter and wattmeter current coil shall be short-circuited.

NOTE The reference in Sub-clause 3.5 to the absence of a correction of the consumption of the voltage circuit of the wattmeter arises from an empirical observation which shows that in most cases, at the same supply voltage, the said consumption compensates approximately for the reduction of the power consumption of the lamp caused by the parallel connection of the voltage circuit of the wattmeter.

If any doubts are felt on this point, it will always be possible to evaluate the compensation error by repeating the measurements with other values of the load in parallel with the lamp.

This is done by adding resistances in parallel with the lamps and by reading each time the power measured by the wattmeter. It is then possible to extrapolate the results obtained in order to determine the true power in the absence of any parallel load.

3.7 The lamp shall be operated until the electrical characteristics are stable before any final readings on the lamp are taken.

3.8 The measurement of the red-ratio is detailed in Appendix D.

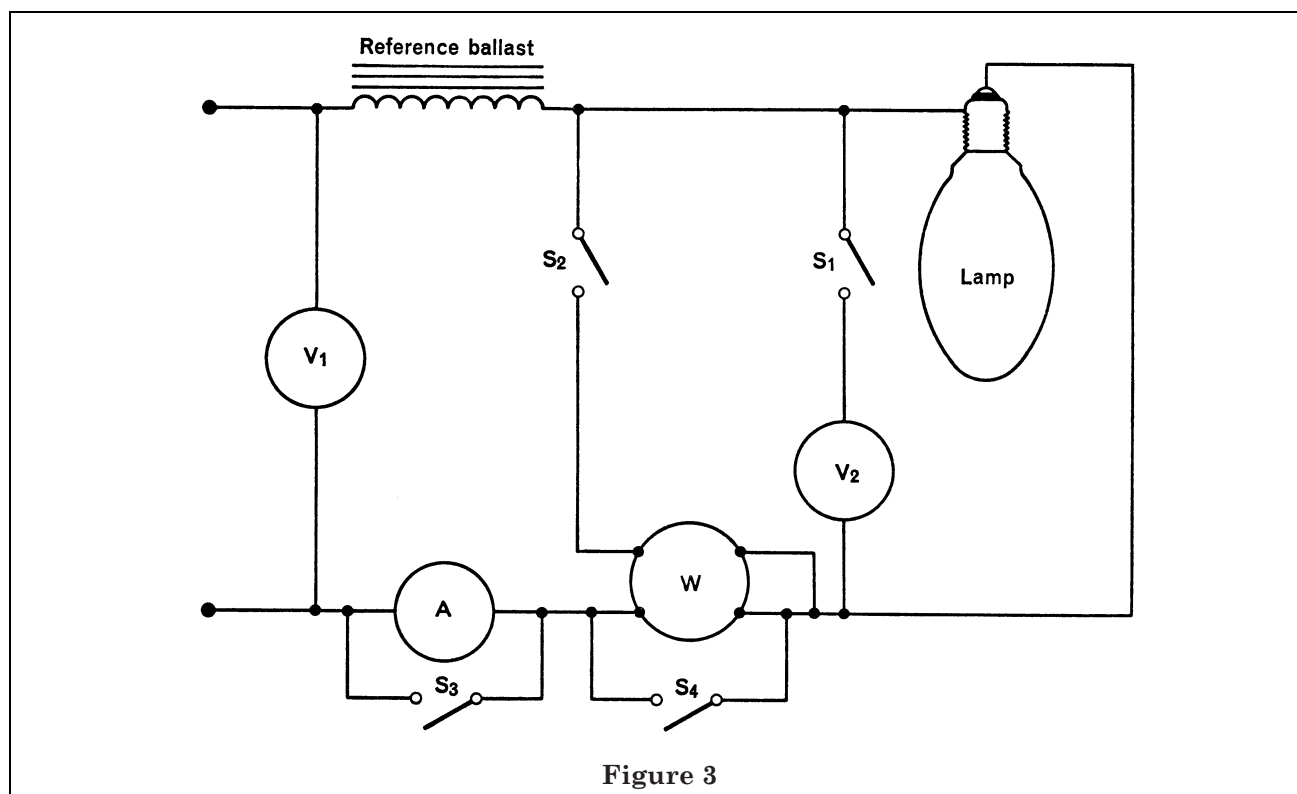


Figure 3

Appendix D Methods of measurement of the red ratio of high-pressure mercury vapour lamps

1 Lamp and filter requirements

The method described makes use of:

1.1 A high-pressure mercury vapour lamp with fluorescent coating of known spectral distribution.

Let such a lamp be identified by N and let $E_{\lambda N}$ be the relative spectral distribution of the lamp's radiated energy (it will necessarily comprise concentrated energies at the spectral lines). The fluorescent coating of this standard lamp N should emit light of a similar spectral distribution to that of the unknown lamp to be compared with it. This is particularly necessary when the coatings emit principally in the red/orange region (around 610–625 nm).

NOTE Some manufacturers will supply lamps together with the spectral analysis of their radiation. There are also specialized laboratories which undertake such measurements.

1.2 A red filter

The exact type is not specified, but the filter must comply with the following requirements for its spectral transmission factor:

- a) A value of less than 0.1 % at 580 nm.
- b) A fairly high and substantially uniform value above 615-620 nm.

NOTE 1 The value at 580 nm is based on the requirement to show no appreciable transmission for the yellow doublet (577-579 nm) of the mercury spectrum.

NOTE 2 Even though catalogue data for a given type of filter may indicate it to be satisfactory, there is very often a spread of the spectral characteristics between filters bearing the same type number but coming from different batches. For this reason, the filter should always be selected to ensure compliance with the requirements listed above.

2 Method of measurement

The light of the lamp X to be tested shall be successively measured without and with interposition of the red filter. The ratio of the second measurement to the first one yields an uncorrected measurement r_{ux} of the red ratio.

Lamp N shall then be used to correct this measurement according to the following method:

The light of the lamp N shall be similarly measured without and with the filter and the ratio of these measurements gives a value r_{un} . The knowledge of the spectral distribution of this lamp then allows its red ratio (r_N) to be computed.

The red ratio, as defined in Sub-clause 2.5, is the ratio of two integrals of the form $\int E_\lambda V(\lambda) d\lambda$ over the red band and over the whole of the visible spectrum.

The ratio $c = \frac{r_N}{r_{un}}$ gives the correction factor required for obtaining the red ratio for lamp X. This red ratio

will be given by $r_X = c \cdot r_{ux}$.

The factor c corrects for both:

- a) the relationship between a measurement made with a filter and the value of the red ratio as defined by the two integrals. This is inherent in the principle of the method;
- b) an allowance for the fact that the photo-receiver used for the measurement will not be, in general, ideally adapted to the relative luminous efficiency $V(\lambda)$.

The method assumes that the ratio between the red ratio according to the definition and its uncorrected measurement with the filter is the same for both lamps X and N.

It is this assumption which (as mentioned in Sub-clause 1.1 above) necessitates that the coatings of both lamps N and X emit light of similar spectral distributions.

NOTE 1 The manufacturers of a lamp will generally be able to state whether the types of lamps may or may not be tested with a Type N as reference.

The method also assumes that the spectral characteristic of the filter remains exactly the same when measuring both lamps N and X. Several types of red filters are very sensitive to temperature so that the slope of their spectral transmission factor relative to wavelengths shifts as the temperature varies. This phenomenon directly affects any response located within the region of this curve. This fact is of primary importance when considering the more recent types of coatings used. In such cases it is absolutely necessary to keep the filter at the same temperature when making measurements to be compared. Any significant heating should be avoided: for instance, by keeping the filter/photo-receiver assembly at sufficient distance from the light sources.

Also, if the filter is placed too near to the photo-receiver, inter-reflections may occur. These, however, will not result in any additional error provided that they remain the same for both comparative measurements. Consequently, since the filter is constantly being removed and inserted, it is necessary to make sure that it is always kept in the same position relative to the photo-receiver.

NOTE 2 The method does not require any determination of the spectral sensitivity of the photo-receiver. It is only necessary to check that the prescribed characteristics of the filter are obtained.

The method may be used either with an integrating (or Ulbricht) sphere or with directional measurements in a dark-room. In the latter case, a single measurement is sufficient if the fluorescent coating is homogeneous; otherwise, several measurements should be taken in different directions and the mean of the intensities used.

If an integrating sphere is used, a slight selectivity of its internal surface finish is immaterial as this is equivalent to an alternation of the spectral sensitivity of the photo-receiver.

NOTE 3 It is recommended that a spectrophotometric check of lamp(s) N should be made after a few hundred hours of operation in order to ascertain whether the spectral distribution is affected by ageing.

Appendix E (normative)

Other international publications quoted in this standard

*This publication is under revision or a revised version has been issued. The Harmonization Documents (HD) in the list based directly on IEC Publications without any modification.

IEC Publications	HD	Date of issue of HD
50(45)* International electrotechnical vocabulary Group 45: Lighting	—	—
61 Lamp caps and holders together with gauges for control of interchangeability and safety	HD 65	sliding latest edition
61-3 (the concerned standard sheets are indicated in the standard) Part 3: Gauges	HD 65.3	sliding latest edition
262 Ballasts for high pressure mercury vapour lamps	—	—

Section 2. Lamp data sheets

8 General principles of numbering sheets

The technical data sheets are numbered as follows: 188-IEC-1-3, 188-IEC-2-3, 188-IEC-3-3, etc.

The first number is the number of this publication. 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	Sheet number
50	E26 or E27	188-IEC-1-3
80	E26 or E27	188-IEC-2-3
125	E26 or E27	188-IEC-3-3
175	E39 or E40	188-IEC-4-3
250	E39 or E40	188-IEC-5-3
400	E39 or E40	188-IEC-6-3
700 (HV)	E39 or E40	188-IEC-7-3
700 (LV)	E39 or E40	188-IEC-8-3
1 000 (HV)	E39 or E40	188-IEC-9-3
1 000 (LV)	E39 or E40	188-IEC-10-3
1 000 (LV)	E39 or E40	188-IEC-11-3
2 000	E39 or E40	188-IEC-12-3

Section 3. Maximum lamp outlines

10 General

Maximum lamp outline requirements are provided for the guidance of designers of luminaires based on a maximum sized lamp inclusive of bulb to cap eccentricity. Mechanical acceptance of the lamp cap and the adjoining part of the lamp neck in the holder is ensured by compliance of the lamp with the gauges for testing contact making as given in IEC Publication 61-3: Lamps Caps and Holders together with Gauges for the Control of Interchangeability and Safety, Part 3: Gauges.

Observance of these requirements in luminaire design will ensure mechanical acceptance of lamps complying with this standard.

11 List of maximum lamp outlines

Wattage (W)	Cap	Sheet number
50	E27	188-IEC-3-2-2
80	E27	188-IEC-3-3-2
125	E27	188-IEC-3-4-2
175	E40	188-IEC-3-5-2
250		
400	E40	188-IEC-3-6-2
700	E40	188-IEC-3-7-2
1 000	E40	188-IEC-3-8-2
2 000	E40	188-IEC-3-9-2

Section 4. Information for luminaire design

12 Maximum cap temperatures

The temperature of the lamp cap shall not exceed the following:

<i>Cap</i>	<i>Maximum cap temperature (°C)</i>
E27	210
E40	250