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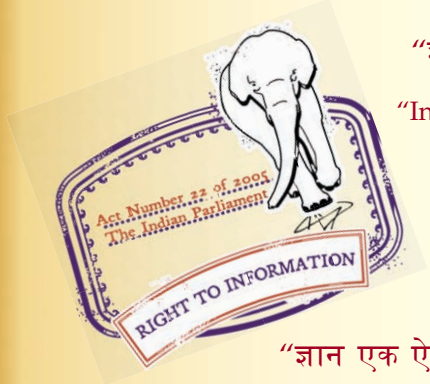

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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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Indian Standard

SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART I REQUIREMENTS AND TESTS

(First Reprint FEBRUARY 1994)

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Gr 5 *July* 1982

Indian Standard

SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART I REQUIREMENTS AND TESTS

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Indian Standard

SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART I REQUIREMENTS AND TESTS

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 28 July 1981, after the draft finalized by the Electric Lamps and Accessories Sectional Committee had been approved by the Electrotechnical Division Council

0.2 For street lighting and industrial lighting where economic operation and high light output are very important considerations, high pressure mercury vapour lamps are generally used on account of their having greater lumen output and longer life, in preference to the general lighting service lamps.

0.3 As a first step towards standardization of high pressure mercury vapour lamps, a schedule covering dimensions and some of the essential characteristics, of HPMV lamps (IS 2183) was first published in 1963 and subsequently revised in 1973 A standard containing methods of tests for HPMV lamps (IS 7023) was published in 1973 It has now been possible to evolve a more detailed specification covering standard types of HPMV lamps and methods of tests to be used for determining their electrical characteristics.

0.4 A definite value for red-ratio (*see* **7.5**) has not been agreed upon and therefore, the requirements for red-ratio shall be a matter of agreement between the purchaser and the supplier

0.5 In this standard requirements and conditions of test for life performance have been kept under consideration as the committee while preparing this standard could not finalize the various parameters involved in the life testing of HPMV lamps. This is under the active consideration of the committee and will be added in the standard after an agreed method of life test and its. criteria for performance has been evolved.

0.6 The nominal life of HPMV lamps for the purpose of guidance may be taken as 5000 hours

0.7 The values given in the standard are with respect to the design voltage of 250 V. However, the lamps can be operated in a voltage range of 200 to 250 V.

0.8 This standard (Part I) is one of the series of Indian Standards which deals with high pressure mercury vapour lamps.

This series will have the following four parts.

Part I	Requirements and tests
Part II	Standard lamp data sheets
Part III	Dimensions of lamp caps
Part IV	'GO' and 'NO-GO' gauges of lamp caps.

This series of Indian Standards, therefore, in due course when all parts are published, will supersede IS 2183-1973 'Schedule for high pressure mercury vapour lamps' and IS 7023-1973 'Methods of tests for high pressure mercury vapour Jamps'.

0.9 In the preparation of this standard, assistance has been derived from IEC 188 (1974) 'High pressure mercury vapour lamps'. International Electrotechnical Commission.

0.10 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard

1. SCOPE

1.1 This standard (Part I) specifies the requirements and 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 ac mains with a ballast satisfying the requirements of IS : 6616-1972†

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions covered by IS : 1885 (Part XVI/Sec 3)-1967‡ and the following shall apply.

2.1 Rated Wattage — The wattage marked on the lamp

2.2 Lamp Starting Voltage—The rms 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

*Rules for rounding off numerical values (*revised*)

†Specification for ballasts for high pressure mercury vapour lamps

‡Electrotechnical vocabulary Part XVI Lighting, Section 3 Lamps and auxiliary apparatus

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 standard 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 Overall Length — Distance from the crown of the bulb to the contact plate of the cap including the solder.

2.11 Type Test — A test or a series of tests made on a type test sample for the purpose of checking the design of a given product with the requirements of the relevant specification

2.12 Batch—The term denotes all the lamps of one type put forward at one time for test for acceptance

2.13 Test Quantities

2.13.1 *Inspection Test Quantity (ITQ)* —The number of lamps selected for the purpose of determining the acceptability of a batch as to marking, mechanical and physical requirements, and starting characteristics.

2.13.2 *Rating Test Quantity (RTQ)*—The number of lamps selected for the purpose of determining the acceptability of a batch as to initial readings and red ratio.

3. RECOMMENDED LAMP TYPES

3.1 The voltage, wattage, cap and bulb finish of the recommended types of high pressure mercury vapour lamps shall be as given in Table 1

TABLE 1 RECOMMENDED TYPE OF LAMPS

(*Clause* 3 1)

WATTAGE (1) (W)	VOLTAGE. (2) (V)	CAP (3)	BULB FINISH (4)
80	200 to 250	E27, B22d-3	Fluorescent coated or clear
125	200 to 250	E27, B22d-3	Fluorescent coated or clear
250	200 t0 250	E40	Fluorescent coated or clear
400	200 tO 250	E40	Fluorescent coated or clear
700	200 to 250	E40	Fluorescent coated or clear
1000	200 to 250	E40	Fluorescent coated or clear

4. MECHANICAL, PHYSICAL AND STARTING REQUIREMENTS

4.1 Mechanical and Physical Requirements

4.1.1 *Glass Bulb* — Glass bulbs of the lamps shall be free from defects detrimental to service

4.1.2 *Caps* — The cap on finished lamp shall comply with the dimensional requirements as given in Part III of this standard The dimensions of the caps shall be cheeked with the 'Go' and 'No Go' gauges of lamp caps as specified in Part IV of this standard

4.1.2.1 The shells of caps may be made of brass or any other suitable material, provided the caps are ordinarily resistant to atmospheric corrosion and withstand the tests specified

4.1.2.2 Contacts shall be evenly soldered or welded to ensure satisfactory engagement and electrical contact in the appropriate holder

NOTE — It is not essential that the whole surface of the eyelet should be covered with solder

4.1.2.3 The cap shall be so constructed and attached to the bulb that it withstands the torsion test specified in Appendix A

4.1.2.4 The insulation resistance between the shell of the bayonet cap and the contact shall be not less than 50 megohms Measurement shall be made one minute after the application of a dc voltage of 500 V Prior to test, the external surface of the insulation of the cap shall be wiped with a dry cloth In case the insulation resistance, after first measurement, is found to be insufficient, the lamps shall be stored in a warm, dry atmosphere for a week and then retested for insulation

4.1.3 *Lamp Dimensions* — The lamp dimensions shall be as specified in the individual lamp data sheets given in Part II ot this standard

4.2 Starting and Warm-Up Characteristics — Before ageing, lamp starting and warm-up characteristics shall be checked as specified in Appendix B.

5. SELECTION OF LAMPS FOR TESTS (SAMPLING)

5.1 Method of Selection — The inspection and rating test quantities specified in the following clauses shall be selected in a mutually agreed manner such as to ensure proper representation of the batch

5.1.1 The selection of lamps for individual batches should be made as follows:

a) Up to and including 20 containers per batch — out of every container an equal number of lamps (or as near to equal as possible) shall be selected at random in order to obtain the 20 lamps required.

b) Over 20 containers per batch — out of 20 containers, evenly distributed over the whole batch, one lamp shall be selected at random from each container to obtain the 20 lamps required.

5.2 Inspection Test Quantity (ITQ) — Inspection test quantity shall consist of 20 lamps

5.3 Rating Test Quantity (RTQ) — Rating test quantity consisting of 15 lamps, shall be selected at random from the lamps which have passed the inspection tests. The RTQ for determining the acceptability as to red ratio may, however, be restricted to three

5.4 Accidentally Broken Lamps — Lamps which are accidentally broken shall, when necessary be replaced to ensure that the required number of lamps are available for tests

6. MARKING

6.1 Each lamp shall be distinctly and indelibly marked with the following:

a) Mark of origin — (this may take the form of a trade-mark, the manufacturer's name and/or identification mark or the name and/or trade-mark of the responsible supplier),

b) Rated wattage;

c) Voltage range for which the lamp is designed to operate, and

d) Country of manufacture

6.1.1 The lamps may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Cirtification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer ISI marked products .are also continuously checked by ISI for conformity to that standerd is a further safeguard Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution

7. REQUIREMENTS AND CONDITIONS OF TEST FOR ELECTRICAL AND LUMINOUS CHARACTERISTICS

7.1 Position of Operation During Ageing and Testing — 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 hours using the circuit and relevant requirements as specified in Appendix B The supply voltage shall not vary by more than ± 10 percent and the frequency by not more than ± 1 Hz

NOTE — 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

7.3.1 The voltage at the lamp terminals using the test conditions specified in Appendix C shall be within the limits specified in the relevant lamp data sheet in Part **II** of this standard.

7.3.2 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 in Part II of this standard

7.4 Luminous Flux — The initial luminous flux of individual lamps when measured in accordance with conditions specified in Appendix C shall not be less than 90 percent of the rated value declared by the manufacturer. The rated value declared by the manufacturer shall not be less than the value specified in the relevant lamp data sheets in Part II of this standard

7.5 Red Ratio (Fluorescent Coated Lamps Only) - The red ratio shall not be less than percent (value under consideration), using the test conditions specified in Appendix D.

7.6 Lamp Stability with Rapidly Reduced Supply Voltage — Lamps shall not extinguish if the supply voltage falls from 100 percent to 90 percent of the rated voltage in not more than 0.5 seconds and remains at that value for at least 5 seconds

8. REQUIREMENTS AND CONDITIONS OF TEST FOR LIFE PERFORMANCE — (Under Consideration)

9. CONDITIONS OF COMPLIANCE

9.1 General Conditions — A batch shall be considered as conforming to this standard if the requirements contained in **9.2** and **9.3** are fulfilled. If the batch fails to satisfy the requirements of any of these clauses, it shall be deemed not to comply with the standard

9.2 Mechanical, Physical, Starting and Marking Requirements — A batch shall be considered to comply with the requirements of **4** and **6**, if the number of lamps failing does not exceed qualifying limits given below:

	Qualifying Limit
a) For any single requirement	2
b) For all requirements taken together	4

9.3 Initial Readings and Red Ratio

9.3.1 *Initial Readings* — A batch shall be considered to comply with the requirements of initial readings, if the number of lamps failing does not exceed the qualifying limits given below

	Qualifying Limit
a) For initial luminous flux of individual lamps	4
b) For wattage of individual lamp and voltage at lamp terminals	4

9.3.2 *Red Ratio* (*Fluorescent Coated Lamps Only*) — Compliance shall be considered to be achieved if all the three lamps of RTQ, (*see* **5.3**) meet the requirements as specified in the relevant lamp data sheet in Part II of this standard

In the event of one or more failure, the remaining lamps of R T Q shall be tested The number of lamps failing shall not exceed four.

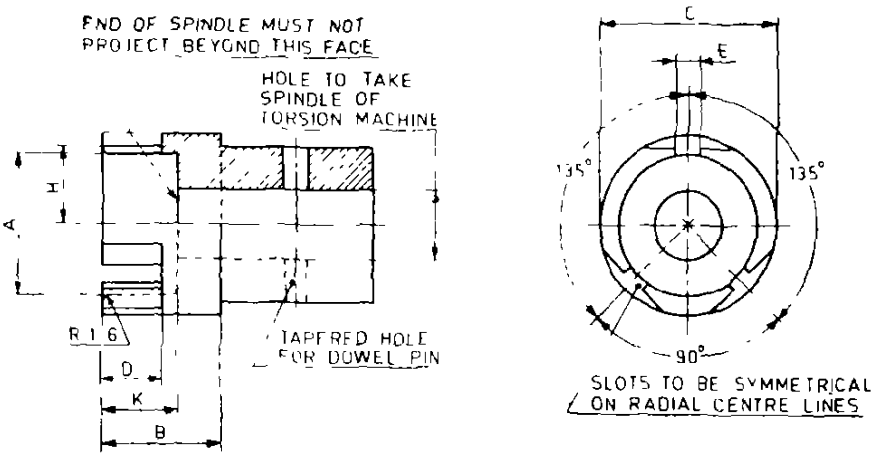
APPENDIX A
(*Clause* 4.1.2.3)

TORSION TEST

A-1. TORSION TEST

A-1.1 The torsion test shall be carried out using the special lamp holders shown in Fig. 1 and 2 and with the following values of torque gradually applied

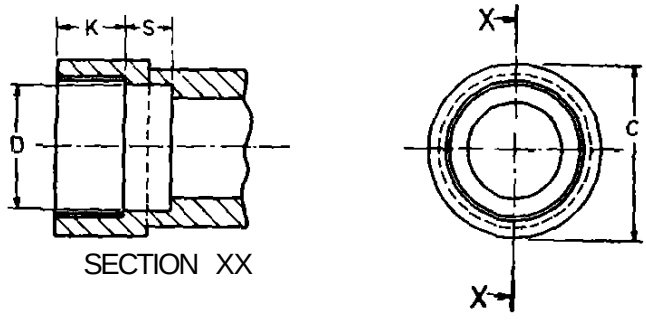
Type of Cap	*Torque*
E22d-3 and E27	30 Nm
E40	50 Nm



All dimensions in millimetres

Ref Letter	*Dimension*	*Tolerance*
A	22·17	+0 03
B	19 05	+ 0·03
C	28 57	± 0 03
D	9 52	± 0·03
E	3·00	+0 20
H	12·30	+0 03
K	19·0	+ 0·03

FIG. 1 TORSION TEST HOLDER FOR CAP B22d-3



All dimensions in millimeters

Dimension	*E*27	*E*40	*Tolerence*
C	32·0	47·0	Minimum
K	11·0	19·0	±0·3
0	23 0	34·0	± 0 1
S	12 0	13·0	Minimum

NOTE — Threads shall be in accordance with holder threads of 'Indian Standard Specification for Edison screw lampholders' (*under preparation*)

FIG 2 TORSION TEST HOLDERS FOR CAPS E27 AND E40

A-2. TORSION TESTING MACHINE

A-2.1 A typical torsion testing machine employed to carry out the torsion test on lamp caps is given in Fig. 3.

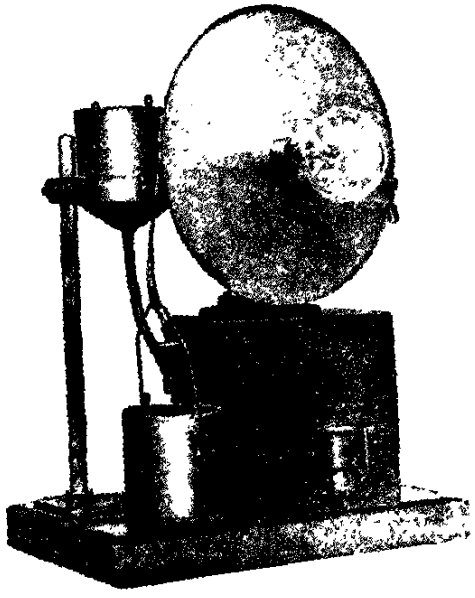


FIG 3 TORSION TESTING MACHINE

APPENDIX B

(*Clauses* 4.2 and 7.2)

STARTING TEST, WARM-UP TEST AND AGEING

B-l. GENERAL

B-l.l Lamps shall not be operated during the period of 5 hours, immediately prior to making this test

B-l.2 They shall be tested and aged using a nominal 50 Hz supply (in an ambient temperature between 20°C and 30°C) using the circuit shown in Fig. 4.

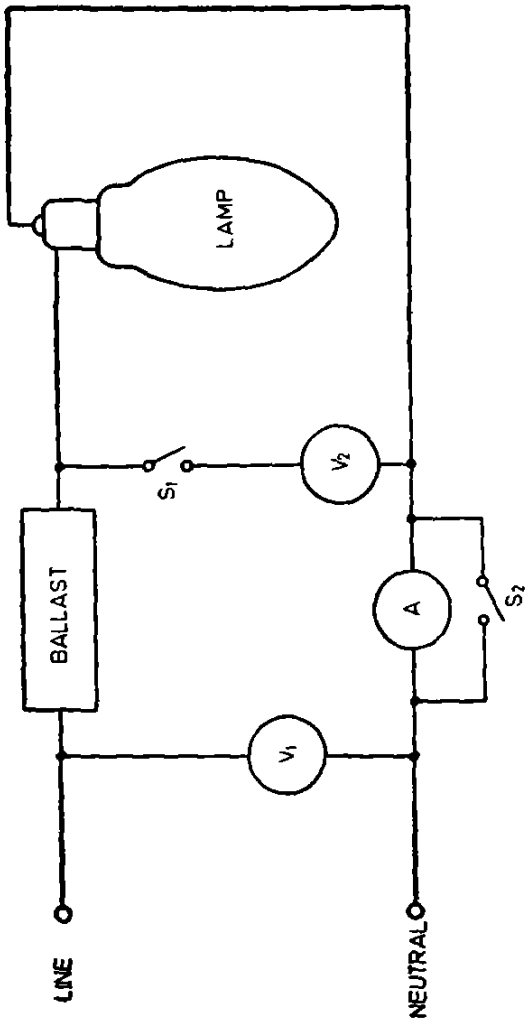


FIG 4 CIRCUIT FOR STARTING TEST, WARM-UP TEST AND AGEING

B-1.3 The ballast shall be of the inductive type and shall satisfy the requirements of IS : 6616-1972*.

B-2. STARTING TEST

B-2.1 For the starting test, the voltage V_1 shall be set to the starting voltage given in the relevant lamp data sheet in Part II of this standard.

B-2.2 The voltmeter V_2 shall be open-circuited using switch S_1.

B-2.3 The ammeter shall be short-circuited using switch S_2

B-3. WARM-UP TEST

B-3.1 Immediately after starting, the supply voltage shall be adjusted to maintain the warm-up lamp current specified in the relevant lamp data sheet in Part II of this standard

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

B-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 data sheet in Part II of this standard

APPENDIX C

(*Clauses* 7.3.1, 7.3.2 *and* 7.4)

METHODS OF MEASURING ELECTRICAL AND LUMINOUS CHARACTERISTICS OF LAMP

C-l. GENERAL

C-l.l Ballasts used for these tests shall be reference ballasts having a voltage-to-current ratio and power factor as specified in the relevant lamp data sheets in Part II of this standard and meeting the general requirements for reference ballasts given in IS : 6616-1972*.

*Specification for ballasts for high pressure mercury vapour lamps

C-1.2 Lamps shall be tested in a circuit using a nominal 50 Hz supply at an ambient temperature between 20°C and 30°C using the circuit shown in Fig 5

C-2. SUPPLY

C-2.1 The frequency shall be that for which the ballast is designed with a tolerance of ± 0·5 percent

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

C-2.3 The total harmonic content of the supply voltage shall not exceed 3 percent, the harmonic content being defined as the root-mean-square (rms) summation of the individual harmonic components, using the fundamental as 100 percent

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 percent, this tolerance being reduced to ± 0 2 percent at the time of measurement

C-3. INSTRUMENTS AND MEASUREMENTS

C-3.1 Potential circuits of instruments connected across a lamp shall take not more than 3 percent of the objective lamp current

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

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

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

C-3.5 When measuring lamp power the lamp voltmeter circuit shall be open and the ammeter shall be short-circuited

C-3.5.1 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

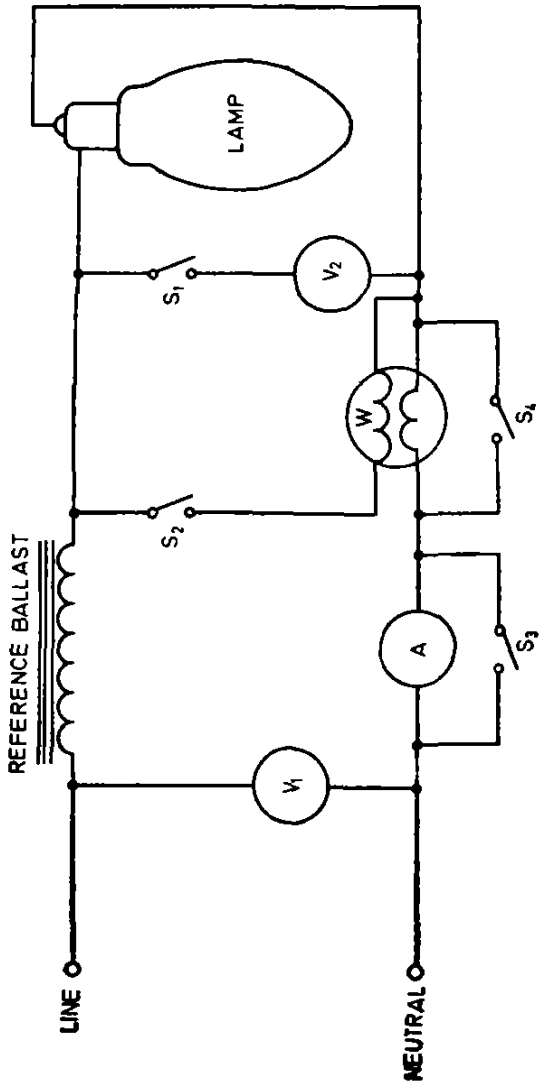


FIG. 5 CIRCUIT FOR MEASUREMENT OF ELECTRICAL AND LUMINOUS CHARACTERISTICS

G-3.6 When measuring luminous flux the potential circuits of the voltmeter V_2 and the wattmeter shall be open and the ammeter and wattmeter current coil shall be short-circuited

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

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

NOTE — The reference in **C-3.5.1** 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

APPENDIX D

(*Clauses* 7.5 *and* C-3.8)

TEST CONDITIONS FOR RED-RATIO MEASUREMENT

D-1. METHOD OF MEASUREMENT OF THE RED-RATIO OF HIGH PRESSURE MERCURY VAPOUR LAMPS

D-1.1 Apparatus

D-1.1.1 The method described here makes use of a high pressure mercury vapour lamp with fluorescent coating of known spectral distribution. Such a lamp will be characterized by the letter *N* and let (E λ) N be the spectral (relative) concentration of the lamp's radiated energy (it will necessarily comprise concentrated energies at the mercury spectral lines and, eventually, at other lines of additional substances)

D-l.1.2 *Red Filter*—No particular type is specified but the filter used shall comply with the following requirements

a) Its spectral transmission factor will be high and substantially uniform in the portion of the red band located above 630 to 640 nm,

b) Below these last values and towards the lower wavelengths, it will show a rapid decrease, such as to become practically zero for a wavelength between 580 and 600 nm.

NOTE — The value 580 is based on the requirement to show no transmission for the yellow doublet (577-579 nm) of the mercury spectrum, should the lamp to be measured contain sodium as an addition, the lower limit of 580 nm should be raised to 590 nm

D-1.1.3 The light of the lamp *X* to be tested is successively measured without and with interposition of the red filter. The ratio of the second measurement to the first one yields an uncorrected measurement $r_u X$ of the red-ratio. The lamp *N* serves precisely to amend this measurement according to the following method:

The lamp *N* is primarily submitted to the same measurements with and without filter as the lamp *X*. The ratio of these measurements gives a value $r_U N$. But, moreover, the knowledge of the spectral distribution of this lamp allows its red-ratio (rN) to be computed according to the very definition of this term

The red-ratio as defined in **2.5** is the ratio of two integrals of the form $E\lambda\ V\ (\lambda)\ d\ \lambda$ over the red band and over the whole of the visible spectrum

The ratio $c = \frac{r N}{r_u N}$ gives then the correction factor required for obtaining the red-ratio for the lamp *X* It will be given by $rX = c.r_u X$

It will be noted that the factor *c* secures jointly two different corrections

a) The first is inherent in the principle of the method, namely, to establish the connection between a measurement made with a filter and the value of the red-ratio as defined by the two integrals, and

b) The second to take care of 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, in fact, 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*

This assumption is sufficiently accurate for industrial purposes as long as the spectral distributions in the red band for both lamps are substantially similar

Should it be proved that such an assumption is incorrect for a given type of lamp, it should then be required to use for such lamps, a lamp *N*, of the same type, spectrally studied, instead of lamp *N*

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

NOTE 2 — The method does not require any determination of the spectral sensitivity of the photo-receiver With respect to the filter it requires only to check if the prescribed qualities are met (flat curve in the upper region and cut)

The method might be used either with an integrating sphere or with direct measurements in a darkroom. In either case, a single measurement is sufficient if the fluorescent coating is homogenous; otherwise several measurements should be taken in different directions

In case of use of an integrating sphere, a slight selectivity of its painting is rather immaterial as its effect may be compared with a systematic alteration of the spectral sensitivity of the photo-receiver.

What matters is that exactly the same procedure be used with both lamps *X* and *N*. Red filters being generally sensitive to temperature, care should be taken to avoid any significant heating.

NOTE — It is recommended to carry out a spectrophotometric checking of lamp(s) *N* after a few hundred hours of operation in order to ascertain if the spectral distribution is affected (or not) by ageing

AMENDMENT NO. 1 NOVEMBER 1987

TO

IS:9900(Part 1)—1981 SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART 1 REQUIREMENTS AND TESTS

(Page 3, clause 0.7) - Substitute the following for the existing clause:

'0.7 The lamps covered by this standard can be operated in a voltage range of 200 to 250 V.'

(Page 7, clause 6.1) - Add the following in the end:

'(e) The rated lumen output.

Note - The manufacturer may declare a higher value of rated lumen output than the minimum specified in the standard. Due to limitation of space on lamps this information may, however, be marked on the carton only.'

(ETDC 23)

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AMENDMENT NO. 2 JUNE 1988
TO
IS : 9900 (Part 1)-1981 SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART 1 REQUIREMENTS AND TESTS

(*Page* 5, *clause* **2.13.2)** — Add the following new clause after **2.13.2:**

'**2.13.3** *Life Test Quantity* (*LTQ*) — The number of lamps selected for the purpose of determining the acceptability of a batch as to life performance.'

(*Page* 7, *clause* **5.3**) — Add the following new clause and renumber the existing clause **5.4** as **5.5** :

'**5.4** *Life Test Quantity (LTQ)* — From the lamps which have passed rating test, they shall be selected at random a LTQ as follows :

a) For lamps up to and including 400 W 10

b) For lamps above 400 W 5'

(*Page* 9, *clause* **8**) — Substitute the following for the existing clause :

'**8. REQUIREMENTS AND CONDITIONS OF TEST FOR LIFE PERFORMANCE**

8.1 After 5 000 hours operation, including the ageing period of 100 hours, the lumen maintenance shall not be less than the value indicated below :

a) For lamps up to and including 400 watts 80 percent

b) For lamps above 400 watts 75 percent'

(*Page* 9, *clause* **9.3.2**) — Add the following new clause after **9.3.2:**

'**9.3.3** *Lumen Maintenance* — A batch shall be considered to comply with the requirements of life if the total number of lamps having lives shorter than 5 000 hours, together with those failing to meet the requirements of lumen maintenance given in 8 does not exceed the qualifying limits given below :

Life Test Quantity	*Qualifying Limit*
10	*2*
5	1'

(ETDC 23)

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AMENDMENT NO. 3 NOVEMBER 1988

TO

IS : 9900 (Part 1) - 1981 SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMPS

PART 1 REQUIREMENTS AND TESTS

[*Page* 9, *clause* **8.1** (*see also* Amendment No. 2)] — Insert the following new clause after **8.1**.

'**8.2** The life test shall be carried out on an ac supply with a declared frequency of 50 Hz which shall be the rated frequency of the ballast The test voltage shall be equal to the rated voltage of the ballast ± 1 percent.

For life testing, commercial ballasts with electrical parameters not differing by more than 3 percent from the reference ballast can be used.

The life test shall be made at an ambient temperature between 15°C and 50°C.

The momentary fluctuation of the test voltage and frequency during the test shall not exceed ± 2 percent in each case.

8.2.1 *Switching 'on' and switching 'off' during life test* — Lamps on life test shall be switched 'off' after every 7½ hours of burning, each 'off' period consisting of ½ hour duration The 'off' period shall not be included in calculating the number of burning hours The life test, as far as possible, shall be done continuously.'

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AMENDMENT NO. 4 APRIL 1989
TO
IS : 9900 (Part 1) - 1981 SPECIFICATION FOR HIGH PRESSURE MERCURY VAPOUR LAMP
PART 1 REQUIREMENTS AND TESTS

(*Page* 7, *clause* **5.1.1)** — Substitute '8' *for* '20' at all places.

(*Page 7, clause* **5.2**) — Substitute '8' *for* '20'

(*Page* 7, *clause* **5.3**) — Substitute '6' *for* '15'

[*Page* 7, *clause* **5.4** (*see also Amendment No. 2*)] — Substitute the following for the existing clause:

'**5.4 Life Test Quantity** (**LTQ**) — From the lamps which have passed rating test, they shall be selected at random a **LTQ** of 4 lamps.'

[*Page* 9, *clause* **9.2** (a) *and* (b)] — Substitute '1' and '2' *for* '2' and '4' respectively under qualifying limits

[*Page 9, clause* **9.3.1** (a) *and* (b)] — Substitue '1' *for* '4' at both the places under qualifying limits.

[*Page* 9, *clause* **9.3.3** (*see also Amendment No* 2)] — Substitute the following for the existing life test quantity and qualifying limits

Life Test Quantity	*Qualifying Limit*
4	1

(ETDC 23)

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