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EUROPEAN STANDARD

**EN 60662/A7**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 1995

UDC 621.327.532.2:620.1  
ICS 29.140.30

Descriptors: Sodium vapor lamp, characteristic, particular requirements, conception requirement

English version

**High-pressure sodium vapour lamps  
(IEC 662:1980/A7:1995)**Lampes à vapeur de sodium à  
haute pression  
(CEI 662:1980/A7:1995)Natriumdampf-Hochdrucklampen  
(IEC 662:1980/A7:1995)**iTeh STANDARD PREVIEW  
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This amendment A7 modifies the European Standard EN 60662:1993; it was approved by CENELEC on 1995-11-28. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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

### Foreword

The text of document 34A/569/DIS, future amendment 7 to IEC 662:1980, 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 A7 to EN 60662:1993 on 1995-11-28.

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) 1996-09-01
- latest date by which the national standards conflicting  
with the amendment have to be withdrawn (dow) 1996-09-91

For products which have complied with EN 60662:1993 and its amendments A4:1994, A5:1994 and A6:1994 before 1995-11-28, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2001-09-01.

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Endorsement notice  
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The text of amendment 7:1995 to the International Standard IEC 662:1980 was approved by CENELEC as an amendment to the European Standard without any modification.

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NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC  
662

1980

AMENDEMENT 7  
AMENDMENT 7

1995-10

Amendement 7

Lampes à vapeur de sodium à haute pression

iTeh STANDARD PREVIEW

Amendment 7

(standards.iteh.ai)

High-pressure sodium vapour lamps

SIST EN 60662:1996/A7:1999

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1232b3a9c6b8/sist-en-60662-1996-a7-1999

*Les feuilles de cet amendement sont à insérer dans  
la CEI 662 (1980).*

*The sheets contained in this amendment are to be  
inserted in IEC 662 (1980).*

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

CODE PRIX  
PRICE CODE

W

*Pour prix, voir catalogue en vigueur  
For price, see current catalogue*

**INSTRUCTIONS POUR L'INSERTION  
DES NOUVELLES PAGES ET FEUILLES  
DANS LA PUBLICATION 662**

**INSTRUCTIONS FOR THE INSERTION  
OF NEW PAGES AND SHEETS IN  
PUBLICATION 662**

1. Retirer la page de titre et insérer la nouvelle page de titre.

**SECTION UN – GÉNÉRALITÉS**

2. Retirer les pages 14 et 16.  
Insérer les nouvelles pages 14 et 16.

**SECTION DEUX – FEUILLES DE  
CARACTÉRISTIQUES DES LAMPES**

3. Retirer la page 66.  
Insérer la nouvelle page 66.
4. Retirer les feuilles de caractéristiques révisées suivantes:

1010-3, page 2, 1020-2 page 2,  
1030-3, page 2, 1040-2 page 2,  
1050-4, page 3, 1060-2 page 3,  
1080-2, page 2, 1110-2 page 2,  
1120-3 page 2, 1130-2 page 2,  
1170-1 page 2, 1180-2 page 2,  
1190-1 page 2, 2120-1 page 2,  
2130-1 page 2, 2140-1 page 2,  
2150-1 page 2 et les remplacer  
par les nouvelles feuilles:  
1010-4 page 2, 1020-3 page 2,  
1030-4 page 2, 1040-3 page 2,  
1050-5 page 3, 1060-3 page 3,  
1080-3 page 2, 1110-3 page 2,  
1120-4 page 2, 1130-3 page 2,  
1170-2 page 2, 1180-3 page 2,  
1190-2 page 2, 2120-2 page 2,  
2130-2 page 2, 2140-2 page 2,  
2150-2 page 2.

5. Ajouter les nouvelles feuilles de caractéristiques suivantes:

2100-1, page 3, 2110-1 page 3,  
2120-1, page 3, 2130-1 page 3,  
2140-1, page 3, 2150-1 page 3,  
3010-1 pages 1, 2 et 3,  
3020-1 pages 1, 2 et 3,  
3030-1 pages 1, 2 et 3.

**SECTION TROIS – ENCOMBREMENT  
MAXIMAL DES LAMPES**

6. Retirer la liste existante et insérer la nouvelle liste.  
Retirer la feuille de caractéristiques 9030-1 et la remplacer par la nouvelle feuille 9030-2. Insérer les nouvelles feuilles de caractéristiques 9011-1 et 9031-1.

1. Remove existing title page and insert new title page.

**SECTION ONE – GENERAL**

2. Remove pages 15 and 17.  
Insert new pages 15 and 17.

**SECTION TWO – LAMP DATA SHEETS**

3. Remove page 67.  
Insert new page 67.

4. Remove existing data sheets:

1010-3, page 2, 1020-2 page 2,  
1030-3, page 2, 1040-2 page 2,  
1050-4, page 3, 1060-2 page 3,  
1080-2, page 2, 1110-2 page 2,  
1120-3 page 2, 1130-2 page 2,  
1170-1 page 2, 1180-2 page 2,  
1190-1 page 2, 2120-1 page 2,  
2130-1 page 2, 2140-1 page 2,  
2150-1 page 2 and replace  
with new data sheets:  
1010-4 page 2, 1020-3 page 2,  
1030-4 page 2, 1040-3 page 2,  
1050-5 page 3, 1060-3 page 3,  
1080-3 page 2, 1110-3 page 2,  
1120-4 page 2, 1130-3 page 2,  
1170-2 page 2, 1180-3 page 2,  
1190-2 page 2, 2120-2 page 2,  
2130-2 page 2, 2140-2 page 2,  
2150-2 page 2.

5. Add the following new sheets:

2100-1, page 3, 2110-1 page 3,  
2120-1, page 3, 2130-1 page 3,  
2140-1, page 3, 2150-1 page 3,  
3010-1 pages 1, 2 and 3,  
3020-1 pages 1, 2 and 3,  
3030-1 pages 1, 2 and 3.

**SECTION THREE – MAXIMUM LAMP  
OUTLINES**

6. Remove existing list and insert new list.

Remove existing data sheet 9030-1 and replace with new data sheet 9030-2. Insert new data sheets 9011-1 and 9031-1.

## AVANT-PROPOS

Le présent amendement a été établi par le sous-comité 34A: Lampes, du comité d'études 34 de la CEI: Lampes et équipements associés.

Le texte de cet amendement est issu des documents suivants:

DIS	Rapport de vote
34A/569/DIS	34A/622/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cet amendement.

## FOREWORD

This amendment has been prepared by sub-committee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

<https://standards.iteh.ai/catalog/standards/sist/b0050b90-260f-4a30-bad1-1232b3a9c6b8/sist-en-60662-1996-a7-1999>

DIS	Report on voting
34A/569/DIS	34A/622/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC  
662

Première édition  
First edition  
1980

Modifiée selon les amendements:  
Amended in accordance with Amendments:  
1 (1986), 2 (1987), 3 (1990), 4 (1992), 5 (1993),  
6 (1994), et/and 7(1995).

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Lampes à vapeur de sodium à haute pression

High-pressure sodium vapour lamps

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## 8. Information for ballast and ignitor design

Ballasts and ignitors shall meet the following requirements to ensure reliable starting and operating conditions. These checks do not constitute lamp requirements.

Except for subclause 8.6, these requirements shall be met over the range of 92% to 106% of the rated voltage of the ballast.

### 8.1 *Open circuit voltage*

Minimum r.m.s. voltage (50 Hz or 60 Hz): 198 V.

### 8.2 *European starting pulse characteristics*

8.2.1 An ignitor shall start lamps which comply with the specified lamp starting test.

8.2.2 The pulse height shall comply with the requirements for ballast design information on the relevant lamp data sheet when measured at the lampholder terminals with the normal circuit connected and the lamp removed from the lampholder.

8.2.3 In designing an ignitor, account shall be taken of pulse attenuation due to cable. The ballast specification shall require the ignitor to be provided with information concerning the maximum value of capacitance consistent with achieving the specified requirements for lamp starting.

### 8.2.4 *General guidance*

8.2.4.1 In general, the requirements in subclause 8.2.1 will be met by a positive pulse of 2 800 V peak having a width of 1  $\mu$ s at 2 500 V and occurring in either half-cycle of the supply voltage.

8.2.4.2 An ignitor may produce a negative or positive pulse in either half-cycle of the supply voltage. If the pulse is negative, it is probable that the pulse height and/or width may need to be increased.

8.2.4.3 For satisfactory performance the pulse shall occur within the phase range 60-90 or 240-270 electrical degrees of the open-circuit voltage (these values are provisional and under study).

8.2.4.4 Where the pulse repetition rate is less than once per cycle, the pulse width may need to be increased.

### 8.3 *North American starting pulse characteristics*

The ignitor may be an integral part of the ballast or a separate device. In either case it shall meet the following requirements:

	Rated wattage	
	250-400 W	1 000 W
Pulse height (measured from zero voltage level of the r.m.s. supply)	2 500 V minimum 4 500 V maximum	3 000 V minimum 5 000 V maximum
Pulse width (minimum)	1 $\mu$ s at 2 250 V	4 $\mu$ s at 2 700 V
Repetition rate (minimum)	Once per cycle	
Pulse position	Between the 90 % point of peak open-circuit voltage (leading edge) and 20 electrical degrees beyond centre of the half-cycle	

For this measurement, the starting pulse shall be applied to the centre contact of the lampholder. A capacitive load of 20 pF shall be connected across the lampholder terminals in place of the lamp.

NOTE – Additional capacitive loading may be necessary to simulate remote mounting of ballasts and ignitors, and further recommendations on this aspect are under consideration.

For lead type ballasts, the pulse repetition rate (minimum) is once per half-cycle. Pulse position is between the 90 % point of the peak open circuit voltage and 15 electrical degrees beyond the centre of the half-cycle.

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#### 8.4 Lamp warm-up current

The lamp warm-up current shall be measured within the range of 5 s to 15 s after the ignition of the lamp arc and shall comply with the values specified on the relevant lamp data sheet.

#### 8.5 Current crest factor

The current crest factor shall comply with the requirements of 8.2 of IEC 923.

#### 8.6 Lamp operating limits for the information of ballast designers

Each of the lamp operating sheets shows a diagram of the lamp voltage and lamp wattage limits within which the lamp should be operated. The minimum voltage limit (left-hand side of the diagram) is the characteristic curve of a lamp whose voltage at rated wattage is the minimum considered acceptable.

The maximum voltage limit (right-hand side of the diagram) is the characteristic curve having a voltage high enough to allow for a lamp with:

- a) maximum zero-hour voltage;
- b) voltage rise during life;
- c) maximum voltage rise due to enclosure in a luminaire.

The wattage limit lines (top and bottom of the diagram) are chosen with regard to the effect of lamp wattage on performance factors such as initial light output, lumen maintenance, lamp life, lamp warm-up, etc.

The supply voltage limits for lamp operation on reactor (choke) ballasts shall be as shown below. The upper supply voltage limit should not be exceeded continuously in lamp use, otherwise special precautions are necessary. Short-term excursions above this limit can be tolerated.

The voltage limits are:

- 1) for rated supply voltages between 100 V and 150 V:
  - between 95 % and 105 % of rated voltage of the ballast;
- 2) for rated supply voltage between 220 V and 240 V:
  - the lower supply voltages limit is 95 % of rated voltage of the ballast;
  - the upper supply voltages are:
    - for lamp ratings below 150 W: rated voltage of the ballast +7 V;
    - for lamp ratings 150 W and above: rated voltage of the ballast +10 V.

The lamp wattage obtained with a reference lamp when measured on a ballast at rated voltage, shall comply with the requirements of clause 20 of IEC 923.

Lamp operating limits and a typical ballast characteristic are given as part of each lamp data sheet.

## SECTION TWO – LAMP DATA SHEETS

## 12 List of specific lamp types Included In this standard

Normal version			
Sheet No.	Rated wattage	Method of starting	Bulb
662-IEC-1010-	250 W	Internal or external	Tubular – clear
662-IEC-1020-	250 W	Internal or external	Elliptical – diffuse coating
662-IEC-1030-	400 W	Internal or external	Tubular – clear
662-IEC-1040-	400 W	Internal or external	Elliptical – diffuse coating
662-IEC-1050-	150 W	Internal or external	Tubular – clear
662-IEC-1060-	150 W	Internal or external	Elliptical – diffuse coating
662-IEC-1070-	100 W HV	External	Tubular – clear
662-IEC-1080-	100 W HV	External	Elliptical – diffuse coating
662-IEC-1090-	100 W LV	External	Elliptical – diffuse coating or clear
662-IEC-1100-	1 000 W EHV		Tubular – clear
662-IEC-1110-	70 W HV	Internal	Elliptical – diffuse coating or clear
662-IEC-1120-	70 W HV	External	Tubular – clear
662-IEC-1130-	70 W HV	External	Elliptical – diffuse coating or clear
662-IEC-1140-	70 W LV	External	Elliptical – diffuse coating or clear
662-IEC-1150-	1 000 W HV	External	Tubular – clear
662-IEC-1160-	1 000 W HV	External	Elliptical – diffuse coating
662-IEC-1170-	50 W HV	Internal	Elliptical – diffuse coating or clear
662-IEC-1180-	50 W HV	External	Tubular – clear
662-IEC-1190-	50 W HV	External	Elliptical – diffuse coating or clear
Colour-improved version			
662-IEC-2100-	150 W	External	Tubular – clear
662-IEC-2110-	150 W	External	Elliptical – diffuse coating
662-IEC-2120-	250 W	External	Tubular – clear
662-IEC-2130-	250 W	External	Elliptical – diffuse coating
662-IEC-2140-	400 W	External	Tubular – clear
662-IEC-2150-	400 W	External	Elliptical – diffuse coating
High colour rendering			
662-IEC-3010-	150 W	Internal	Elliptical clear and diffuse coating
662-IEC-3020-	250 W	Internal	Elliptical clear and diffuse coating
662-IEC-3030-	400 W	Internal	Elliptical clear and diffuse coating

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## HIGH-PRESSURE SODIUM VAPOUR LAMPS

## Technical data sheet

Page 2

Rated wattage: 250 W

With internal or external ignitor

Tubular bulb – clear

## Reference ballast characteristics

		American practice	European practice
		Rated frequency (Hz)	60
Rated voltage (V)		220	220
Calibration current (A)		3,0	3,0
Voltage/current ratio		59,0	60,0
Power factor		0,075 ± 0,005	0,06 ± 0,005

## Lamp dimensions (see appendix B)

Cap	Bulb diameter (max.) <i>D</i>	Overall length (max.) <i>L</i>	Light centre length <i>C</i>	Arc length (nominal) <i>A</i>	Deviation of any point along centre line of arc tube from axis of cap (apex of cap eyelet used as the point of reference)	Operating position limitation
	(mm)	(mm)	(mm)	(mm)		
E39 <sup>1)</sup>	52	250	155-165	65		As indicated by lamp manufacturer
E39 <sup>2)</sup>	59	248	143-149	67	3 degrees	
E40	48 <sup>3)</sup>	260	153-163	65		

## Ballast design information (see clause 8)

		Maximum	Minimum
Lamp warm-up current for ballast design (r.m.s.)	(A)	5,2	3,0
Pulse height for ballast design	European practice (V)	5 000	2 800
	American practice (V)	4 500	2 500
Lamp operating limits are shown graphically on page 3.			

## Luminaire design information (see clause 9)

Voltage increase at lamp terminals (maximum)	(V)	10
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1) Japanese practice.

2) American practice.

3) There are presently also lamp designs with a maximum bulb diameter of 60 mm. In some luminaires this may give rise to interchangeability problems.