SLOVENSKI STANDARD
SIST EN 60081:1999/A6:2018

01-januar-2018

Fluorescenčne sijalke z dvema vznožkoma - Zahteve glede tehničnih lastnosti - Dopolnilo A6 (IEC 60081:1997/A6:2017)

Double-capped fluorescent lamps - Performance specifications (IEC 60081:1997/A6:2017)

Lampes à fluorescence à deux culots - Spécifications de performance (IEC 60081:1997/A6:2017)

Ta slovenski standard je istoveten z: EN 60081:1998/A6:2017

ICS:

29.140.30	Fluorescenčne sijalke. Sijalke	Fluorescent lamps. Discharge lamps

SIST EN 60081:1999/A6:2018 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60081:1998/A6

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English Version

Double-capped fluorescent lamps - Performance specifications (IEC 60081:1997/A6:2017 , modified)

Lampes à fluorescence à deux culots - Spécifications de performance
(IEC 60081:1997/A6:2017 , modifiée)

Zweiseitig gesockelte Leuchtstofflampen - Anforderungen an die Arbeitsweise
(IEC 60081:1997/A6:2017 , modifiziert)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 34A/2014/FDIS, future IEC 60081:1997/A6, prepared by SC 34A "Lamps" of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60081:1998/A6:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-06-29
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-09-29

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IEC 60081

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 6
AMENDEMENT 6

Double-capped fluorescent lamps – Performance specifications

Lampes à fluorescence à deux culots – Prescriptions de performance

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.140.30

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FOREWORD

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

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

FDIS	Report on voting
34A/2014/FDIS	34A/2026/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.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INSTRUCTIONS POUR L'INSERTION DES NOUVELLES PAGES ET FEUILLES DE CARACTÉRISTIQUES DANS LA PUBLICATION IEC 60081

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2. Remplacer les feuilles de caractéristiques:

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2. Replace the lamp data sheets:

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Annex E
(informative)

Information for ballast and starter design

E.1 General

In order to safeguard proper functioning of the lamp, the relevant information, given on the lamp data sheet and in Annex E, should be taken into account when designing ballasts and starters.

E.2 Prestarting conditions for high frequency operated lamps

For lamps operated on high frequency and having preheated cathodes, the requirements for proper preheating are specified on the relevant lamp data sheet. An explanation of these requirements is given in Annex D of IEC 60929 and in Annex B of IEC 60927.

For some lamps, additional information concerning high frequency non-preheat starting requirements is given on the relevant lamp data sheet.

E.3 Frequency to be used for high frequency operated lamps

For lamps designed for operation on high frequency, the lamp data sheets specify a frequency range for the reference ballast and for the testing of lamps (starting, electrical and photometric characteristics). This frequency range has been chosen for ease of reproducing test results and is not intended to restrict the design of high frequency ballasts, where for practical reasons a higher frequency may be appropriate.

E.4 Tolerable DC-offset during preheat

The peak-peak value of the open-circuit voltage shall be less than or equal to 2,8 times the maximum r.m.s value of the open-circuit voltage for $t \leq t_s$. Narrow voltage peaks during the first half period of the mains voltage after switching on preheat shall be disregarded when testing the control gear in accordance with Clause E.4.

The DC-offset (mean value) of the open-circuit voltage shall not exceed the r.m.s. open circuit voltage for $t \leq t_s$ as specified on the relevant lamp data sheet. In cases where the r.m.s. open circuit voltage for $t \leq t_s$ is specified to less than 200 V, the DC-offset of the open-circuit voltage shall be less than or equal to 200 V.

E.5 Tolerances on substitution resistors

E.5.1 Lamp electrode substitution resistors

The tolerance for the resistance values of electrode substitution resistors shall be ±1 % of the resistance value or better.

Non-inductive resistors are recommended as substitution resistors.

E.5.2 Lamp impedance substitution resistors

The tolerance for the resistance values of the substitution resistors for the lamp discharge impedance shall be ±5 % of the resistance value or better.

Non-inductive resistors are recommended as substitution resistors.

E.6 Maximum asymmetric power

Lamp caps may overheat at the end of the lamp life cycle. Limiting the power available to the electrodes at the end of the life cycle is considered as a way for the controlgear to mitigate this risk. The maximum control gear asymmetric power available to the electrodes should be equal or less than the power listed in Table E.1.

Table E.1 – Maximum asymmetric power

Sheet number 60901-IEC-	Nominal power W	Nominal dimensions mm	Cap	Maximum asymmetric power W
1020	4	16 × 150	G5	7,5
1030	6	16 × 225	G5	7,5
1040	8	16 × 300	G5	7,5
1060	13	16 × 525	G5	7,5
2120	15	26 × 450	G13	10
2215	15	26 × 550	G13	10
2220	18	26 × 600	G13	10
2230	20	32 × 600	G13	10
2240	20	38 × 600	G13	10
2315	25	38 × 970	G13	10
2320	30	26 × 900	G13	10
2340	30	38 × 900	G13	10
2420	36	26 × 1 200	G13	10
2425	38	26 × 1 050	G13	10
2430	40	32 × 1 200	G13	10
2440	40	38 × 1 200	G13	10
2520	58	26 × 1 500	G13	10
2530	65	32 × 1 500	G13	10
2540	65	38 × 1 500	G13	10
2620	70	26 × 1 800	G13	10
2640	75	38 × 1 800	G13	10
2660	80	38 × 1 500	G13	10
2670	85	38 × 1 800	G13	10
2840	100	38 × 2 400	G13	10
2880	125	38 × 2 400	G13	10
3020	4	16 × 150	G5	7,5
3030	6	16 × 225	G5	7,5
3040	8	16 × 300	G5	7,5
4240	20	38 × 600	G13	10
4340	30	38 × 900	G13	10
4440	40	38 × 1 200	G13	10
4540	65	38 × 1 500	G13	10
4640	75	38 × 1 800	G13	10
4660	80	38 × 1 500	G13	10
4670	85	38 × 1 800	G13	10
4880	125	38 × 2 400	G13	10

Sheet number 60901-IEC-	Nominal power W	Nominal dimensions mm	Cap	Maximum asymmetric power W
5230	20	32 × 600	G13	10
5240	20	38 × 600	G13	10
5340	30	38 × 900	G13	10
5430	40	32 × 1 200	G13	10
5440	40	38 × 1 200	G13	10
5540	65	38 × 1 500	G13	10
5840	85	38 × 2 400	G13	10
5960	60	38 × 1 200	R17d	10
5970	87	38 × 1 800	R17d	10
5980	112	38 × 2 400	R17d	10
6030	6	7 × 220	W4.3	3,5
6040	8	7 × 320	W4.3	3,5
6050	11	7 × 420	W4.3	3,5
6060	13	7 × 520	W4.3	3,5
6520	14	16 × 550	G5	7,5
6530	21	16 × 850	G5	7,5
6620	24	16 × 550	G5	7,5
6640	28	16 × 1 150	G5	7,5
6650	35	16 × 1 450	G5	7,5
6730	39	16 × 850	G5	7,5
6750	49	16 × 1 450	G5	7,5
6840	54	16 × 1 150	G5	7,5
6850	80	16 × 1 450	G5	7,5
7220	16	26 × 600	G13	10
7420	32	26 × 1 200	G13	10
7520	50	26 × 1 500	G13	10
8240	20	38 × 600	Fa6	10
8440	40	38 × 1 200	Fa6	10
8540	65	38 × 1 500	Fa6	10
8640	39	38 × 1 200	Fa8	10
8740	57	38 × 1 800	Fa8	10
8840	75	38 × 2 400	Fa8	10
9420	32	26 × 1 200	Fa6	10
9520	50	26 × 1 500	Fa6	10

	DOUBLE-CAPPED FLUORESCENT LAMP DATA SHEET	Page 1

ILCOS: FD-4-E-G5-16/150

Nominal power W	Circuit	Cathode	Cap	Nominal dimensions mm
4	With starter	Preheated	G5	16 × 150

Dimensions mm				
A	B		C	D
Max.	Min.	Max.	Max.	Max.
135,9	140,6	143,0	150,1	16,0

Starting characteristics			
Frequency Hz	Ballast rated voltage V	Test voltage (r.m.s.) V	Starting time s
50	110/120	103,5	30
60	110/120	103,5	30

Electrical characteristics						
Frequency Hz	Rated power W	Voltage (r.m.s.) at lamp terminals V			Rated lamp current A	Rated preheat current A
		Rated	Minimum	Maximum		
50	4,5	29	24	34	0,170	0,205
60	4,5	29	24	34	0,170	0,205

Chromaticity co-ordinates: See Clause D.2.

Cathode characteristics			
Test current A	Resistance of each cathode Ω		
	Rated	Minimum	Maximum
0,110	80	60	100

NOTE In Japan, the rated resistance of each cathode is 90 Ω and maximum is 120 Ω.

	DOUBLE-CAPPED FLUORESCENT LAMP DATA SHEET	Page 2

ILCOS: FD-4-E-G5-16/150

Reference ballast characteristics					
Frequency Hz	Nominal power W	Rated voltage V	Calibration current A	Voltage/current ratio Ω	Power factor
50	6	127	0,160	700	0,12
60	6	118	0,160	650	0,075

Information for ballast design				
Frequency	Hz		50	60
Preheat cathode current	A	Min.	0,144	0,144
		Max.	0,275	0,275
Open circuit voltage across starter	V	Min. (r.m.s.)	103,5	103,5
Open circuit voltage across lamp	V	Max. (peak)	400	400
Substitution resistor for both cathodes in series	Ω		140	140
Voltage across starter with lamp operating	V	Max. (r.m.s.)	68	68

Information for starter design	
Pulse voltage V	Non-reclosure voltage V
Minimum	Maximum
250	70

	DOUBLE-CAPPED FLUORESCENT LAMP DATA SHEET	Page 3

ILCOS: FD-4-E-G5-16/150

Information for high frequency ballast design

HF measurement ballast characteristics				
Frequency	Nominal power	Rated voltage	Calibration current	Resistance
kHz	W	V	A	Ω
20 to 26	4	48	150	160

Typical lamp characteristics			
Frequency kHz	Lamp power W	Lamp voltage V	Lamp current A
≥ 20	3,6	24	0,15

Frequency					kHz	≥ 20
Normal operation						
Lamp operating current	I_D	A			Min.	0,090
					Max.	0,180
Current in any lead to cathodes		A			Max.	0,190
Dimming operation						
Lamp operating current	I_D	A			Min.	0,015
					Max.	0,090
Minimum sum of squares lead currents	$I_{LH}^2 + I_{LL}^2 = X_1 - Y_1 I_D$	A^2			X_1 A^2	0,022
Target sum of squares lead currents	$I_{LH}^2 + I_{LL}^2 = X_1 - 0,3\ Y_1 I_D$	A^2			Y_1 A	0,205
Maximum sum of squares lead currents	$I_{LH}^2 + I_{LL}^2 = X_2 - Y_2 I_D$	A^2			X_2 A^2	0,030
					Y_2 A	-0,050
Current in any lead to cathodes	I_{LH}	A			Max.	0,190
	I_{LL}	A			Max.	0,120
Substitution resistor for each cathode for testing dimming requirements					R_{Test1} Ω	80
					R_{Test2} Ω	90
Lamp substitution resistor at *n* % of the test current	*n* =	10 %	R_{10}	Ω	Min.	1 500
					Max.	1 800
		30 %	R_{30}	Ω	Nominal	510
		60 %	R_{60}	Ω	Nominal	240
Starting requirements with cathode preheating, for starting times 0,4 s < t_s < 3,0 s						
Minimum cathode preheat energy	$E_{min} = Q_{min} + P_{min} t_s$	J			Q_{min} (J)	1,0
					P_{min} (W)	0,7
Voltage across each cathode for $E(t) < E_{min}$		V			Max.(r.m.s.)	11
Substitution resistor for each cathode, for testing minimum cathode preheat requirements					Ω	50
Maximum cathode preheat energy	$E_{max} = Q_{max} + P_{max} t_s$	J			Q_{max} (J)	1,5
					P_{max} (W)	1,1
Substitution resistor for each cathode, for testing maximum cathode preheat requirements					Ω	65
Open circuit voltage across lamp (with starting aid)		V	Non-ignition voltage	$t \le t_s$	Max.(r.m.s.)	90
			Ignition voltage	$t > t_s$ (+10 °C)	Min.(r.m.s.)	160
				$t > t_s$ (-15 °C)	Min.(r.m.s.)	220
Substitution resistor range for each cathode, for testing open circuit voltage requirements					Ω	50……150

	DOUBLE-CAPPED FLUORESCENT LAMP DATA SHEET	Page 1

ILCOS: FD-6-E-G5-16/225

Nominal power W	Circuit	Cathode	Cap	Nominal dimensions mm
6	With starter	Preheated	G5	16 × 225

Dimensions mm				
A	B		C	D
Max.	Min.	Max.	Max.	Max.
212,1	216,8	219,2	226,3	16,0

Starting characteristics			
Frequency Hz	Ballast rated voltage V	Test voltage (r.m.s.) V	Starting time s
50	110/120	103,5	30
60	110/120	103,5	30

Electrical characteristics						
Frequency Hz	Rated power W	Voltage (r.m.s.) at lamp terminals V			Rated lamp current A	Rated preheat current A
		Rated	Minimum	Maximum		
50	6	42	36	48	0,160	0,205
60	6	42	36	48	0,160	0,205

Chromaticity co-ordinates: See Clause D.2.

Cathode characteristics			
Test current A	Resistance of each cathode Ω		
	Rated	Minimum	Maximum
0,110	80	60	100

NOTE In Japan, the rated resistance of each cathode is 90 Ω and maximum is 120 Ω.

	DOUBLE-CAPPED FLUORESCENT LAMP DATA SHEET	Page 2

ILCOS: FD-6-E-G5-16/225

Reference ballast characteristics					
Frequency Hz	Nominal power W	Rated voltage V	Calibration current A	Voltage/current ratio Ω	Power factor
50	6	127	0,160	700	0,12
60	6	118	0,160	650	0,075

Information for ballast design				
Frequency		Hz	50	60
Preheat cathode current	A	Min.	0,144	0,144
		Max.	0,275	0,275
Open circuit voltage across starter	V	Min. (r.m.s.)	103,5	103,5
Open circuit voltage across lamp	V	Max. (peak)	400	400
Substitution resistor for both cathodes in series		Ω	140	140
Voltage across starter with lamp operating	V	Max. (r.m.s.)	68	68

Information for starter design	
Pulse voltage V	Non-reclosure voltage V
Minimum	Maximum
250	70