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IEC 81 : 1974

(Including Amendment No. 1)

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Tubular fluorescent lamps for general lighting service

Part 1. Specification for internationally specified lamps

[IEC title: Tubular fluorescent lamps for general lighting service]

Lampes tubulaires à fluorescence pour l'éclairage générale
Partie 1. Spécification des lampes spécifiées sur le plan international

Röhrförmige Leuchtstofflampen für allgemeine Beleuchtung
Teil 1. Spezifikation für international spezifizierte Lampen

National foreword

This British Standard, which has been prepared under the direction of the Electrical Illumination Standards Committee, is in two Parts and revises BS 1853 which was first published in 1952 and then revised in 1956, 1960, 1967 and 1974.

Part 1 which specifies tubular fluorescent lamps for international use, implements CENELEC Harmonization Document No. 81 of the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC Publication 81, third edition – ‘Tubular fluorescent lamps for general lighting service’, which was issued as an IEC Recommendation in 1974 and amended in 1976.

Amendment No. 1 (1976) to IEC 81 : 1974 has been incorporated in the text of Part 1. Places in the text which have been thus amended are indicated by a rule in the margin. In addition, a correction to amendment No. 1 has also been incorporated.

Part 2 specifies those tubular fluorescent lamps which are used in the United Kingdom and are not specified in Part 1 of the standard.

Terminology and conventions. The text of the international standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

Wherever the word ‘recommendation’ appears, referring to this standard, it should be read as ‘British Standard’.

References in the text to page numbers referring to this standard relate to IEC page numbers.

The present convention (British and international) is to print symbols for dimensions, such as those included in the diagrammatic drawings and lamp cap data sheets, in italic (sloping) type.

Cross-references

International standard	Corresponding British Standard
IEC 61-1-2-3: 1969	BS 5101: Parts 1, 2 and 3: 1975 Lamp caps and holders together with gauges for the control of interchangeability and safety (Identical)
IEC 82: 1973	BS 2818: 1973 Ballasts for the operation of tubular fluorescent lamps on a.c. 50 Hz and 60 Hz supplies (Related)
IEC 155: 1973	BS 3772: 1975 Starters for fluorescent lamps (Related)

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British Standard

Tubular fluorescent lamps for general lighting service

Part 1. Specification for internationally specified lamps

SECTION I — GENERAL

1. Scope

This recommendation covers a range of tubular fluorescent lamps for general lighting service which are operated on a.c. mains. Lamps of the following types are included:

- 1) lamps with pre-heated cathodes operated with the use of a starter;
- 2) lamps with pre-heated cathodes operated without the use of a starter;
- 3) lamps with non-pre-heated cathodes operated without the use of a starter.

The specific lamp types included are listed on page 13.

Section II consists of a series of standard data sheets, each one giving the characteristics of a specific lamp type. In the case of general service lamps, complete characteristics are given together with reference to Section III for the test and compliance requirements. In the case of some new lamps, or lamps not yet in general demand, only limited characteristics are given and limited reference to testing requirements is made.

Section III covers the technical requirements with which lamps shall comply and the testing methods to be used for checking quality and interchangeability for type testing, for individual lamp batches or for the whole production of a manufacturer, in an endeavour to maintain the community of interest of user and manufacturer.

Note. — It may be expected that lamps which comply with this recommendation, when operated with a starter complying with IEC Publication 155, Glow Starters for Tubular Fluorescent Lamps, and with ballasts complying with IEC Publication 82, Ballasts for Fluorescent Lamps, will start and operate satisfactorily at 90% of rated voltage and at temperatures between $+10^{\circ}\text{C}$ to $+50^{\circ}\text{C}$. However, for 50°C , starting only and not immediate restarting of a hot lamp may be obtained.

2. Definitions

2.1 Tubular fluorescent lamp

A low pressure mercury-discharge lamp of tubular form either straight or U-shaped or curved in which most of the light is emitted by a layer of fluorescent material excited by the ultra-violet radiation from the discharge.

Notes 1. — The present specification takes into consideration three types of fluorescent lamps:

- a) lamps with pre-heated cathodes operated with the use of a starter;
- b) lamps with pre-heated cathodes operated without the use of a starter;
- c) lamps with non-pre-heated cathodes operated without the use of a starter.

It may happen that the same lamp can be suitable for both methods of operation a) and b) given above. In normal operation the cathodes are continuously heated, in the case of lamps of type a) and c) by the arc current only, and in the case of lamps of type b), supplementary heating by a current supplied by the ballast may be added.

2. — Definitions for types of cathodes in relation to their resistance are under consideration.

2.2 Lumen maintenance

The ratio of the luminous flux of an individual lamp after 2 000 h of operation, or 70% of its rated life, as appropriate, to that found in the rating test.



Documents

Document Sharing Hub

2.3 *Life*

The life of a lamp is the number of hours it operates to “burn-out” or to any other criterion of life performance laid down in this specification.

2.4 *Colour*

The colour characteristics of a lamp are defined by the colour appearance and the colour rendition.

- a) The actual colour of the lamp is called colour appearance and is defined in terms of the spectral tristimulus values according to the recommendations of the International Commission on Illumination (C.I.E.).
- b) The effect which the spectral characteristics of the light emitted by the lamp have on the appearance of the objects illuminated by it is called colour rendition.

2.5 *Rated colour*

The rated colour is the colour corresponding to the colour designation marked on the lamp.

- Standard Colour 1 corresponds to a correlated colour temperature of 6 500 K.
- Standard Colour 2 corresponds to a correlated colour temperature of 4 300 K.
- Standard Colour 3 corresponds to a correlated colour temperature of 2 900 K.

2.6 *Rated wattage*

The rated wattage is the wattage marked on the lamp or, alternatively, declared by the supplier. It is expressed in watts.

2.7 *Rated luminous flux*

The rated luminous flux is the luminous flux marked on the lamp or declared as such by the supplier. It is expressed in lumens.

2.8 *Rated life*

The rated life is the declared life.

2.9 *Group*

This term denotes lamps of the same rated electrical characteristics and physical dimensions.

2.10 *Type*

This term denotes lamps of the same group having the same photometric ratings and colour characteristics.

2.11 *Batch*

This term denotes all the lamps of one type put forward at one time for acceptance tests.

2.12 *Whole production*

The whole production of a manufacturer is defined as a list of the entire range of types which a manufacturer agrees to submit to checking, this list being reproduced on the certificate supplied by the body responsible for carrying out the checks.

2.13 Test quantities

- a) *Inspection test quantity* (I.T.Q.) is the number of lamps selected for the purpose of determining the acceptability of a batch or of the whole production of a manufacturer as to mechanical and physical requirements, and starting characteristics.
- b) *Rating test quantity* (R.T.Q.) is the number of lamps selected for the purpose of determining the acceptability of a batch or of the whole production of a manufacturer as to initial readings, and colour.
- c) *Life test quantity* (L.T.Q.) is the number of lamps selected for the purpose of determining the acceptability of a batch or of the whole production of a manufacturer as to life performance.
- d) *Type test quantity* (T.T.Q.) is the number of lamps selected for the purpose of determining the acceptability of a lamp type.

2.14 Initial readings

The initial readings are the measurements of the luminous and electrical characteristics, excluding the checking of starting voltages, made at the end of the 100-hour ageing period.

3. General principles of layout of data sheets

Number of each sheet: 81-IEC-/0000-X, where X = edition number.

3.1 Grouping

Sheet numbers	Method of starting	Cathode	
		Type	Resistance
81-IEC-1000 — 1999	Starter	Pre-heated	High Low
81-IEC-2000 — 2999	Starter	Pre-heated	
81-IEC-3000 — 3999	Starterless	Pre-heated	
81-IEC-4000 — 4999		Pre-heated	
81-IEC-5000 — 5999		Pre-heated	
81-IEC-6000 — 6999		Pre-heated	
81-IEC-7000 — 7999	Starterless	Non-pre-heated	
81-IEC-8000 — 8999			
81-IEC-9000 — 9999			

SECTION II — LAMP DATA SHEETS

List of specific lamp types included in this publication

Note. — Lamps indicated by an asterisk against the sheet number are subject to type testing only.

All other Lamps are subject to the compliance requirements of Section V of this publication.

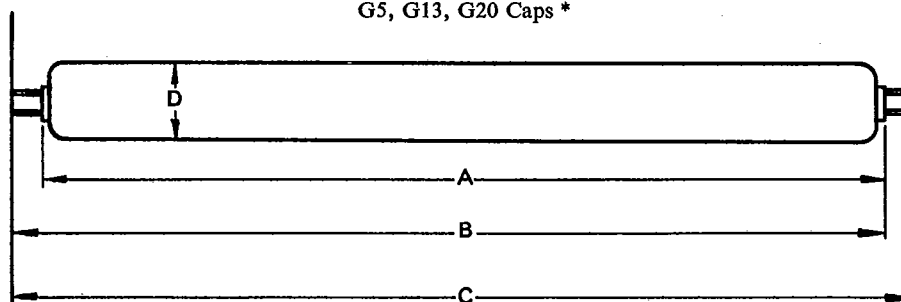
Sheet No.	Lamp rating	Cap	Method of starting	Cathode type	
* 81-IEC-1020-1	4 W	G5	Starter	Pre-heated	
* 81-IEC-1030-1	6 W	G5	Starter	Pre-heated	
* 81-IEC-1040-1	8 W	G5	Starter	Pre-heated	
* 81-IEC-1050-1	13 W	G5	Starter	Pre-heated	
81-IEC-1110-1	20 W	G13	Starter	Pre-heated	
81-IEC-1150-1	25 W	G13	Starter	Pre-heated	
81-IEC-1210-1	30 W (T8)	G13	Starter	Pre-heated	
81-IEC-1220-1	30 W (T12)	G13	Starter	Pre-heated	
81-IEC-1310-1	40 W	G13	Starter	Pre-heated	
81-IEC-1550-1	65 W	G13	Starter	Pre-heated	
81-IEC-1710-1	80 W	G13	Starter	Pre-heated	
81-IEC-1780-1	85 W	G13	Starter	Pre-heated	
81-IEC-1930-1	125 W	G13	Starter	Pre-heated	
* 81-IEC-2130-1	22 W	G10q	Starter	Pre-heated	
* 81-IEC-2230-1	32 W	G10q	Starter	Pre-heated	
* 81-IEC-2350-1	40 W	G10q	Starter	Pre-heated	
81-IEC-2810-1	90 W	G20	Starter	Pre-heated	
81-IEC-4110-1	20 W	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4210-1	30 W (T8)	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4220-1	30 W (T12)	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4310-1	40 W	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4710-1	80 W	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4780-1	85 W	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-4930-1	125 W	G13	Starterless	Pre-heated	High-cathode resistance
81-IEC-5110-1	20 W	G13	Starterless	Pre-heated	Low-cathode resistance
81-IEC-5210-1	30 W (T8)	G13	Starterless	Pre-heated	Low-cathode resistance
81-IEC-5220-1	30 W (T12)	G13	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5225-1	30 W (T12)	G13 **	Starterless	Pre-heated	Low-cathode resistance
81-IEC-5310-1	40 W	G13	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5325-1	40 W	G13 **	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5350-1	40 W	G10q	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5520-1	60 W	R17d	Starterless	Pre-heated	Low-cathode resistance
81-IEC-5550-1	65 W	G13	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5760-1	85 W	G13	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5770-1	87 W	R17d	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-5920-1	112 W	R17d	Starterless	Pre-heated	Low-cathode resistance
* 81-IEC-8110-1	20 W	Fa6	Starterless	Non-pre-heated	
* 81-IEC-8290-1	39 W	Fa8	Starterless	Non-pre-heated	
* 81-IEC-8310-1	40 W	Fa6	Starterless	Non-pre-heated	
* 81-IEC-8470-1	57 W	Fa8	Starterless	Non-pre-heated	
* 81-IEC-8650-1	75 W	Fa8	Starterless	Non-pre-heated	

** Low starting voltage lamps (L.S.V.) with internal conducting layer.

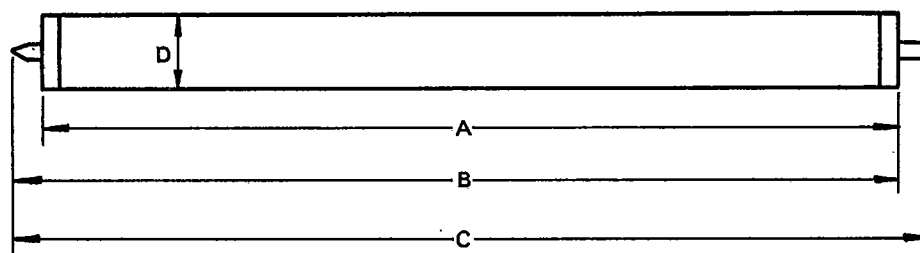
TUBULAR FLUORESCENT LAMP STANDARD SHEET
Diagrammatic drawings for location of lamp dimensions — Linear lamps

These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.

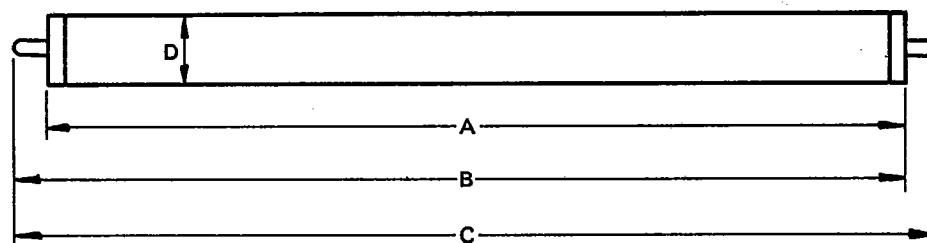
G5, G13, G20 Caps *



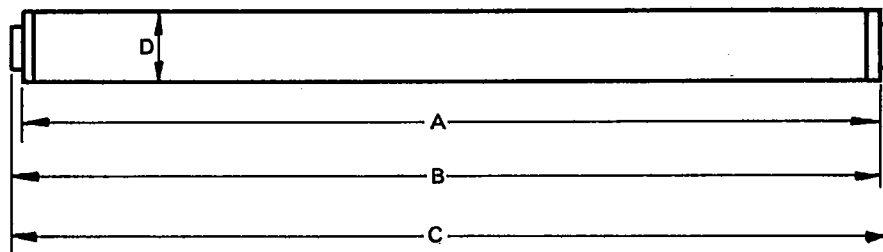
Fa6 Cap *



Fa8 Cap *



R17d Cap *



* See IEC Publication 61, Lamp Caps and Holders Together with Gauges for the Control of Interchangeability and Safety.

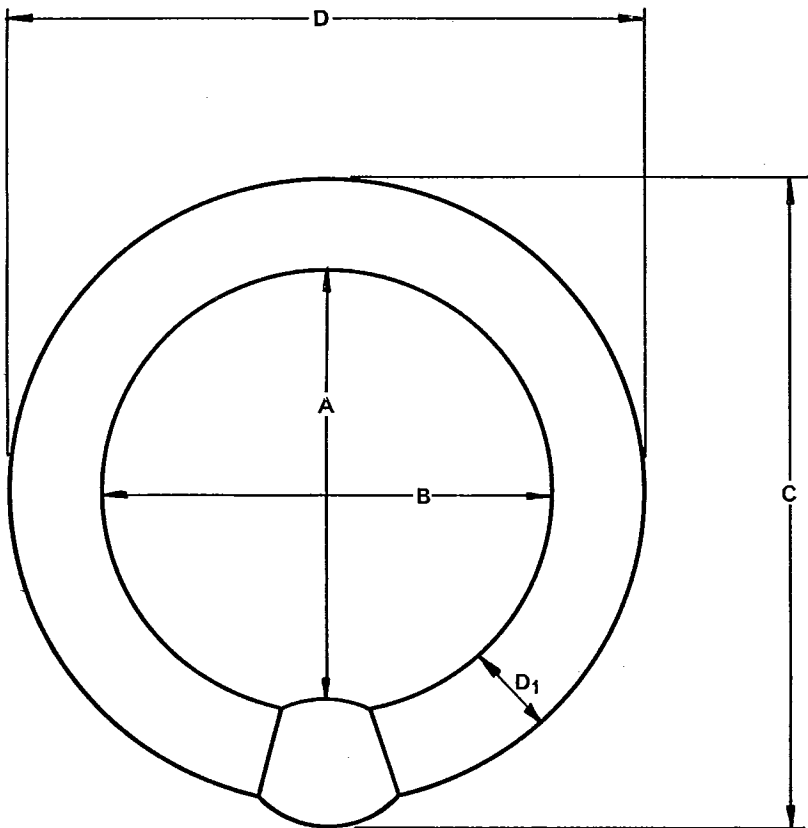
TUBULAR FLUORESCENT LAMP STANDARD SHEET

Diagrammatic drawings for location of lamp dimensions

Circular lamps

These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.

G10q Cap *



* See IEC Publication 61, Lamp Caps and Holders Together with Gauges for the Control of Interchangeability and Safety.

TUBULAR FLUORESCENT LAMP DATA SHEET

Nominal dimensions	Cap	Rating	Starting
150 mm × 15 mm	G5	4 W	With starter

Note. — This lamp is subject to type test only.

Mechanical and physical requirements

For lamp marking, tubes, dimensions and caps, Clauses 8 to 11 of this publication apply.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
135.7	142.9	140.5	150	16

Electrical characteristics

For position of operation and ageing, Clauses 13 and 14 of this publication apply.

Lamp electrical characteristics								
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Starting test voltage (V)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
				Objective	Max.	Min.	Running	Pre-heat
50	4	—	—	—	—	—	—	—
60	—	4.5	—	29	—	—	0.170	0.205

Ballast characteristics

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/current ratio (Ω)	Power factor
50	—	—	—	—	—
60	6	118	0.160	650	0.075 ± 0.005

TUBULAR FLUORESCENT LAMP DATA SHEET

Nominal dimensions	Cap	Rating	Starting
225 mm × 15 mm	G5	6 W	With starter

Note. — This lamp is subject to type test only.

Mechanical and physical requirements

For lamp marking, tubes, dimensions and caps, Clauses 8 to 11 of this publication apply.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
211.9	219.1	216.7	226.2	16

Electrical characteristics

For position of operation and ageing, Clauses 13 and 14 of this publication apply.

Lamp electrical characteristics								
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Starting test voltage (V)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
				Objective	Max.	Min.	Running	Pre-heat
50	6	—	—	—	—	—	—	—
60	6	6	—	42	—	—	0.16	0.205

Ballast characteristics

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/current ratio (Ω)	Power factor
50	—	—	—	—	—
60	6	118	0.160	650	0.075 ± 0.005

TUBULAR FLUORESCENT LAMP DATA SHEET

Nominal dimensions	Cap	Rating	Starting
300 mm × 15 mm	G5	8 W	With starter

Note. — This lamp is subject to type test only.

Mechanical and physical requirements

For lamp marking, tubes, dimensions and caps, Clauses 8 to 11 of this publication apply.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
288.1	295.3	292.9	302.4	16

Electrical characteristics

For position of operation and ageing, Clauses 13 and 14 of this publication apply.

Lamp electrical characteristics								
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Starting test voltage (V)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
				Objective	Max.	Min.	Running	Pre-heat
50	8	—	—	—	—	—	—	—
60	8	7.2	—	57	—	—	0.145	0.205

Ballast characteristics

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/current ratio (Ω)	Power factor
50	—	—	—	—	—
60	6	118	0.160	650	0.075 ± 0.005

TUBULAR FLUORESCENT LAMP DATA SHEET

Nominal dimensions	Cap	Rating	Starting
525 mm × 15 mm	G5	13 W	With starter

Note. — This lamp is subject to type test only.

Mechanical and physical requirements

For lamp marking, tubes, dimensions and caps, Clauses 8 to 11 of this publication apply.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
516.7	523.9	521.5	531	16

Electrical characteristics

For position of operation and ageing, Clauses 13 and 14 of this publication apply.

Lamp electrical characteristics								
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Starting test voltage (V)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
				Objective	Max.	Min.	Running	Pre-heat
50	13	13	180	95	105	85	0.165	0.225
60	13	13	—	95	—	—	0.165	0.225

Ballast characteristics

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/current ratio (Ω)	Power factor
50	—	—	—	—	—
60	13	236	0.165	1 200	0.075 ± 0.005

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
600 mm × 38 mm	G13	20 W	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
589.8	596.9	594.4	604	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
95	110

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	20	19.3	57	64	50	0.37	0.55
60	20	20.5	57	64	50	0.38	0.55

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
880	1 020	1 060	0.309	0.327	0.368	0.371	0.438	0.401

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	20	127	0.37	270	0.12
60	20	118	0.38	240	0.075

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
95	400	0.333	0.800
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
68		50 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
970 mm × 38 mm	G13	25 W	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
970	977.1	974.7	984.3	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	220

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	25	24.5	94	104	84	0.29	0.45
60	—	—	—	—	—	—	—

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
1 250	1 650	1 720	0.309	0.327	0.368	0.371	0.438	0.401

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	25	220	0.29	605	0.10
60	—	—	—	—	—

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.261	0.609
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
128		50 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
900 mm × 25 mm	G13	30 W (T8)	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
894.6	901.7	899.2	908.8	28

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	220

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	30	30	96	106	86	0.365	0.55
60	30	30.5	99	109	89	0.355	0.53

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
1 650	1 940	2 020	0.309	0.327	0.365	0.373	0.432	0.403

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
80%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	30	220	0.36	480	0.10
60	30	236	0.355	548	0.075

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.328	0.766
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
128		50 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
900 mm × 38 mm	G13	30 W (T12)	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
894.6	901.7	899.2	908.8	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	220

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	30	29.5	81	91	71	0.405	0.62
60	—	—	—	—	—	—	—

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
1 580	1 860	1 930	0.309	0.327	0.368	0.371	0.438	0.401

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	30	220	0.405	460	0.10
60	—	—	—	—	—

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.365	0.850
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
128		40 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
1 200 mm × 38 mm	G13	40 W	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
1 199.4	1 206.5	1 204.0	1 213.6	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	220

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	40	39.5	103	113	93	0.43	0.65
60	40	40	102	112	92	0.435	0.65

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
2 300	2 700	2 800	0.309	0.327	0.368	0.371	0.438	0.401

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	40	220	0.43	390	0.10
60	40	236	0.43	439	0.075

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.387	0.904
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
128		40 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
1 500 mm × 38 mm	G13	65 W	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
1 500.0	1 507.1	1 504.7	1 514.2	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	220

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	65	64	110	120	100	0.67	1.0
60	—	—	—	—	—	—	—

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
3 750	4 400	4 600	0.309	0.327	0.368	0.371	0.435	0.402

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	65	220	0.67	240	0.10
60	—	—	—	—	—

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.603	1.41
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
132		25 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting
1 500 mm × 38 mm	G13	80 W	With starter

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
1 500.0	1 507.1	1 504.7	1 514.2	40.5

Lamp starting test	
Test voltage (V)	Ballast voltage rating (V)
180	240

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	80	76	99	109	89	0.87	1.30
60	—	—	—	—	—	—	—

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
4 250	5 000	5 200	0.309	0.327	0.365	0.373	0.432	0.403

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
80%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	80	240	0.865	223	0.06
60	—	—	—	—	—

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
180	400	0.79	1.83
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
128		25 Ω	

TUBULAR FLUORESCENT LAMP DATA SHEET

Page 1

Nominal dimensions	Cap	Rating	Starting	Cathode
1 800 mm × 38 mm	G13	85 W	With starter	—

Mechanical, physical and starting requirements

For lamp marking, tubes, dimensions, caps and starting requirements, Clauses 8 to 12 of this publication apply. For conditions of compliance, Clause 22 applies.

Lamp dimensions (mm) — See Sheet 81-IEC-0001-1				
A	B		C	D
Max.	Max.	Min.	Max.	Max.
1 763.8	1 770.9	1 768.4	1 778.0	40.5

Lamp starting test (see footnote)	
Test voltage (V)	Ballast voltage rating (V)
216	240

Initial readings and colour

For lamp voltage, wattage and luminous characteristics, Clauses 15 and 16 of this publication apply. For conditions of compliance, Clause 23 applies.

Lamp electrical characteristics							
Frequency (Hz)	Rated wattage (W)	Objective wattage (W)	Voltage (r.m.s.) at lamp terminals (V)			Nominal current (A)	
			Objective	Max.	Min.	Running	Pre-heat
50	85	84	120	130	110	0.80	1.30
60	—	—	—	—	—	—	—

Luminous and colour characteristics								
Minimum rated luminous flux, in lumens			Chromaticity co-ordinates					
Colour			1		2		3	
1	2	3	x	y	x	y	x	y
4 700	5 800	6 000	0.309	0.327	0.365	0.373	0.432	0.403

Note. — The ballast for the lamp starting test is an 80 W-240 V inductive ballast, complying with IEC Publication 82.

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TUBULAR FLUORESCENT LAMP DATA SHEET

Page 2

Life test

For life test, Clause 18 of this publication applies. For conditions of compliance, Clause 24 applies.

Minimum lumen maintenance	
2 000 h	70% life
85%	70%

Ballast

The requirements of IEC Publication 82 apply.

Reference ballast characteristics (see footnote)					
Frequency (Hz)	Rated wattage (W)	Rated voltage (V)	Calibration current (A)	Voltage/ current ratio (Ω)	Power factor
50	85	240	0.865	223	0.06
60	—	—	—	—	—

Information for ballast design			
Open circuit voltage (V)		Pre-heating current (A)	
Min. (r.m.s.) at starter	Max. (peak) at lamp	Min.	Max.
216	400	0.72	1.70
Max. (r.m.s.) voltage across starter terminals with lamp operating		Equivalent resistance of both cathodes in series	
160		25 Ω	

Note. — An 80 W rated reference ballast may be used since the reference ballast for the 1 800 mm/85 W lamp has the same voltage/current ratio, power factor and other characteristics as the 80 W ballast.