

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Fluorescent induction lamps – Performance specification

Lampes fluorescentes à induction – Spécification de performance



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**FLUORESCENT INDUCTION LAMPS –
PERFORMANCE SPECIFICATION**

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International Standard IEC 62639 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

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

FDIS	Report on voting
34A/1526/FDIS	34A/1555/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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INTRODUCTION

Performance standard IEC 62639 follows IEC 62532:2011-01, which is the safety standard for induction lamps.

Requirements are given on marking, dimensions, starting characteristics, electrical characteristics, photometric characteristics, lumen maintenance and life. Further, information is given for designing ballasts and luminaires.

The requirements are detailed by means of lamp data sheets, diagrammatic data sheets and maximum lamp outline sheets.

FLUORESCENT INDUCTION LAMPS – PERFORMANCE SPECIFICATION

1 Scope

This International Standard specifies the performance requirements for fluorescent induction lamps for general lighting purposes.

In this standard, the term “lamp” stands for “induction lamp”.

It may be expected that lamps which comply with this standard will start and operate satisfactorily at voltages between 92 % and 106 % of rated supply voltage and at an ambient air temperature between 10 °C and 50 °C, when operated with ballasts complying with IEC 60929 and IEC 61347-2-3, as far as applicable, and in a luminaire complying with IEC 60598-1.

NOTE For some lamps, additional information for ballast design is given for proper starting at an ambient air temperature of –15 °C.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60081:1997, *Double-capped fluorescent lamps – Performance specifications*

IEC 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60929, *AC and/or DC-supplied electronic control gear for tubular fluorescent lamps – Performance requirements*

IEC 61347-2-3, *Lamp control gear – Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps*

IEC 62532:2011, *Fluorescent induction lamps – Safety specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62532 and IEC 60081 apply, together with the following.

3.1

ambient temperature

T_{amb}

average temperature of air or another medium in the vicinity of the lamp

3.2

stabilization period

time required after switching on a lamp to reach stable values of luminous flux or lamp voltage

Note 1 to entry: Requirements on luminous flux are given in 4.6 and on tolerance of luminous flux in Clause B.2.

3.3

reference ballast

special electronic ballast, which is specified by the design specification of manufacturer

It is designed for the purpose of providing comparison standards for use in testing ballasts, for the selection of reference lamps or for testing regular production lamps under standardized conditions. It is essentially characterized by the fact that, at its rated frequency, it has a stable voltage/current ratio which is relatively uninfluenced by variations in current, temperature and magnetic surroundings, as outlined in the relevant ballast standard.

[SOURCE: IEC 60050-845:1987, 845-08-36, modified]

3.4

life

<general term> time during which a lamp is operated until its failure

Note 1 to entry: Switch-off times are not regarded when calculating life.

3.5

nominal life

life (in hours) as declared by the manufacturer

It is published together with the switching cycle and failure rate on which it is based.

Note 1 to entry: Example for a short version: 12B10 (12 h switching cycle / 10 % failures).

4 Lamp requirements

4.1 General

A lamp, on which compliance with this standard is claimed, shall comply with the requirements of IEC 62532.

A lamp has to comply with further requirements or more stringent requirements, if they published by manufacturer.

A lamp shall be so designed that its performance is reliable in normal and accepted use. In general, this can be achieved by satisfying the requirements of the following subclauses.

The requirements and information given apply to 95 % of production.

NOTE The requirements and tolerances permitted by this standard correspond to the testing of a type test sample, submitted by the manufacturer for that purpose. In principle, this type test sample should consist of units having characteristics typical of the manufacturer's production and being as close to the production centre point values as possible.

It may be expected with the tolerances given in the standard that products manufactures in accordance with the type test sample will comply with the standard of the majority of production. Due to the production spread however, it is inevitable that there will sometimes be products outside the specified tolerances.

Measurements are carried out under reference conditions with values specified on the data sheets, if available. Except where otherwise specified in the annexes, lamps shall be tested in an ambient temperature of between 20 °C and 27 °C.

4.2 Marking

4.2.1 General

In addition to the marking requirements of IEC 62532, the following is specified.

4.2.2 Correlated colour temperature (CCT) and colour rendering index (R_a)

The value of the correlated colour temperature and colour rendering index shall be provided on the lamp itself or on the packaging (under consideration). The value representing CCT and R_a may take the form as given in the International Lamp Coding System (ILCOS).

NOTE An R_a of 80 and a CCT of 3 000 K may be combined in the abbreviation "830".

4.2.3 Polarity

The polarity shall be identified by marking the terminals (+, -). Other means of identifying are possible instead, see Clause B.2.

4.3 Dimensions

The dimensions of a lamp shall comply with the values specified on the relevant lamp data sheet.

Compliance: By measuring with callipers or equivalent.

4.4 Starting characteristics

A lamp shall start fully within the time specified on the relevant lamp data sheet and remain alight.

Compliance: Visual inspection to verify that lamps are starting and remain alight. If the lamp has achieved breakdown at $\leq U_{\min}$ and stayed alight, it has passed the test.

Conditions and method of test are given in Annex A.

4.5 Electrical characteristics

Requirements for lamp voltage and power are given below.

- The initial reading of the voltage at the lamp terminals shall comply with the values specified on the relevant lamp data sheet.
- The initial reading of the power dissipated by a lamp shall not exceed the rated power specified on the relevant lamp data sheet by more than 5 %.

Conditions and method of test are given in Annex B.

4.6 Photometric characteristics

Requirements for luminous flux, chromaticity coordinates and colour rendering index are given below.

- The initial reading of the luminous flux of a lamp shall be not less than 90 % and the average of a batch shall be not less than 95 % (under consideration) of the declared value.
- If specified, the initial reading of the chromaticity co-ordinates x and y of a lamp shall be within 5 SDCM (standard deviation of colour matching) from the rated values.
- The initial reading of the general colour rendering index R_a of a lamp shall be not less than the rated value decreased by three.

Conditions and method of test are given in Annex B.

4.7 Lumen maintenance

The lumen maintenance of a lamp, at any time in its life, shall be not less than 90 % of the rated lumen maintenance value.

Conditions and method of test are given in Annex C.

4.8 Life

Requirements are provided by the lamp manufacturer.

5 Information for ballast design

Refer to the relevant lamp data sheet and to Annex D for information for ballast design.

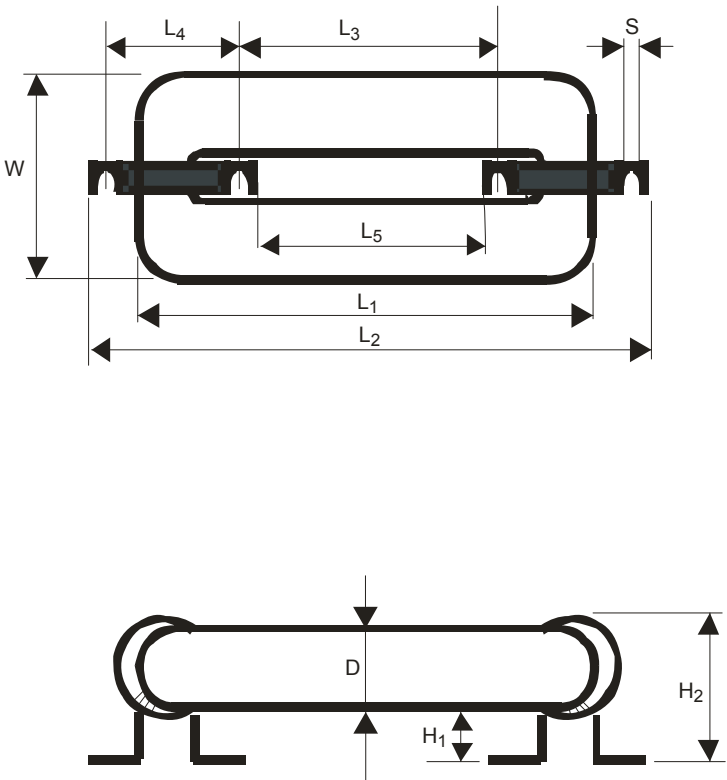
6 Information for luminaire design

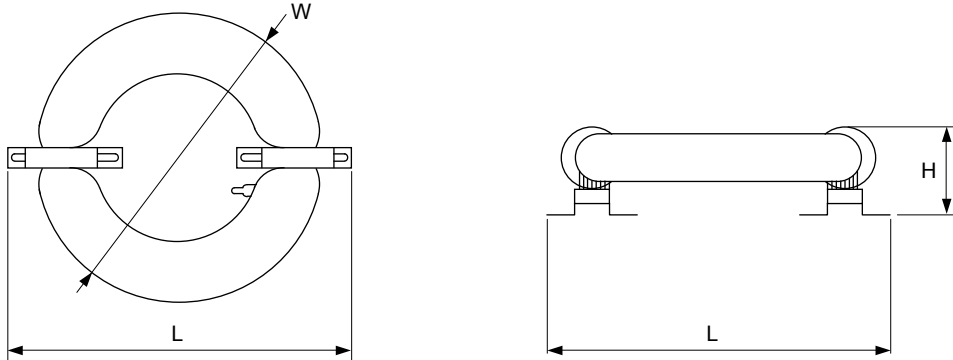
Refer to the relevant lamp data sheet and to Annex E for information for luminaire design. The regional requirements on EMC should be regarded.

7 Data sheets

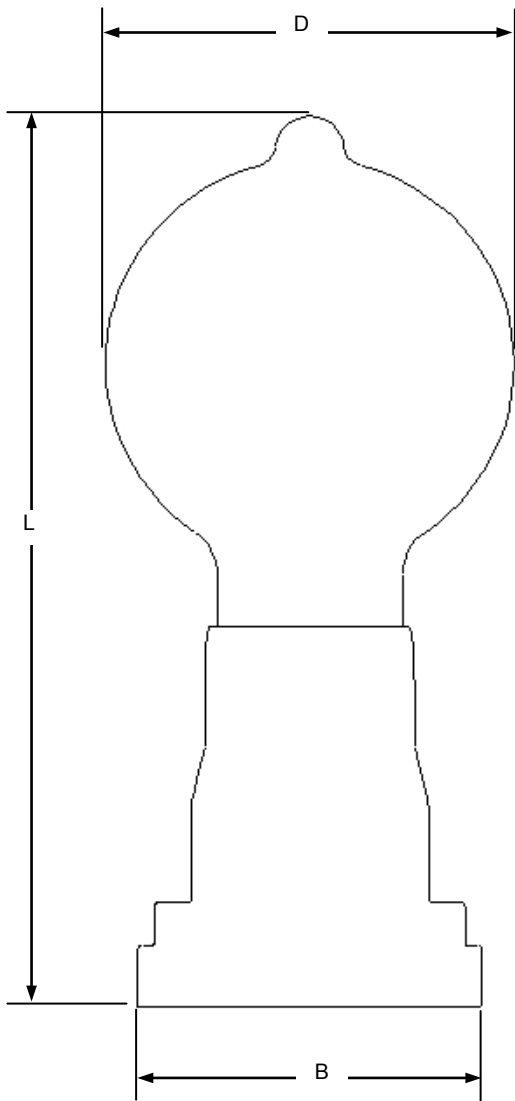
7.1 Diagrammatic data sheets for location of lamp dimensions

62639-IEC-01	rectangular shaped lamps
62639-IEC-02	circular shaped lamps
62639-IEC-03	A110, A130 and A140 shaped lamps
62639-IEC-04	G95 shaped lamps
62639-IEC-05	PS110 shaped lamps
62639-IEC-06	PS180 shaped lamps
62639-IEC-07	R160 shaped lamps
62639-IEC-08	T85 shaped lamps

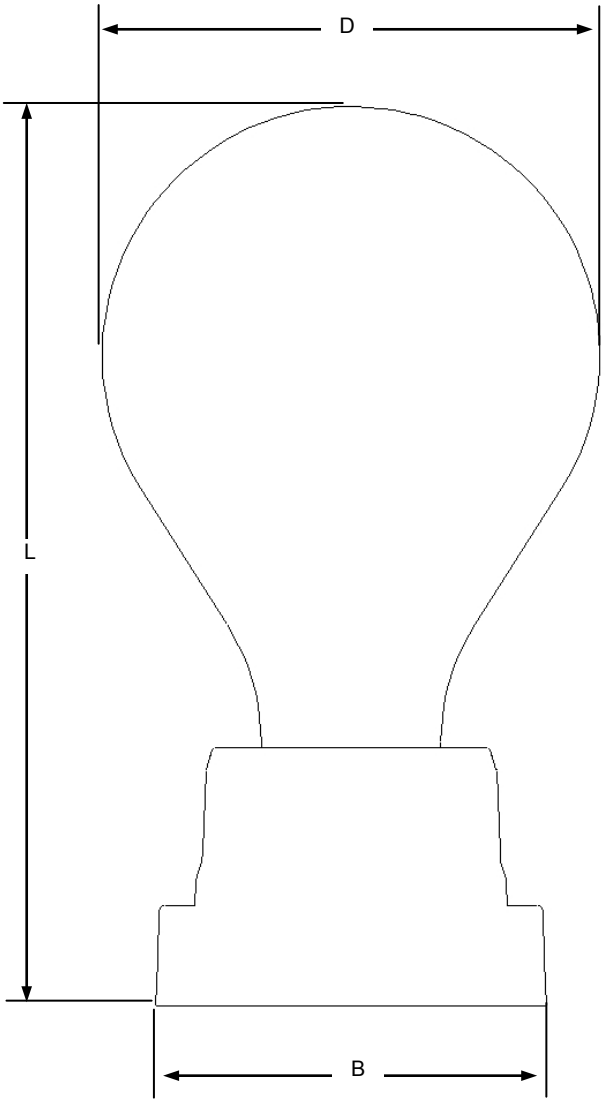
	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS Rectangular shaped, externally coupled, a-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets. 	
Texte français au verso French text overleaf	62639-IEC-01-1	

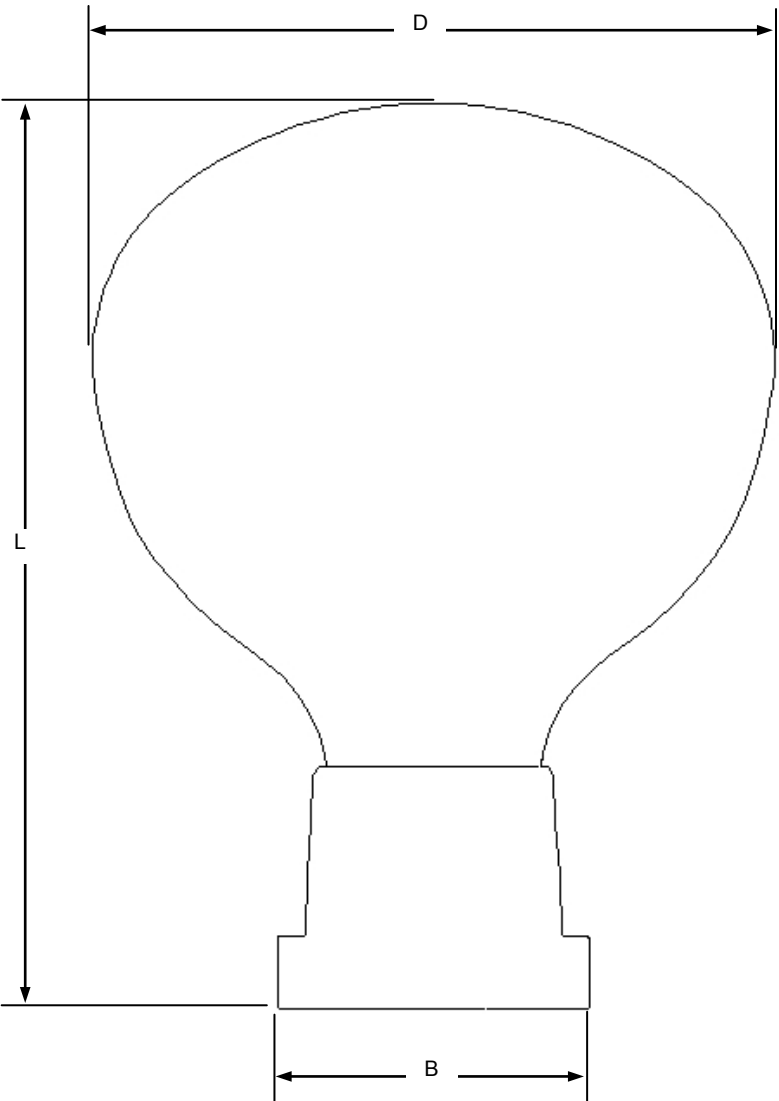
	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS Circular shaped, externally coupled, b-type	
These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets. 		
Texte français au verso French text overleaf	62639-IEC-02-1	

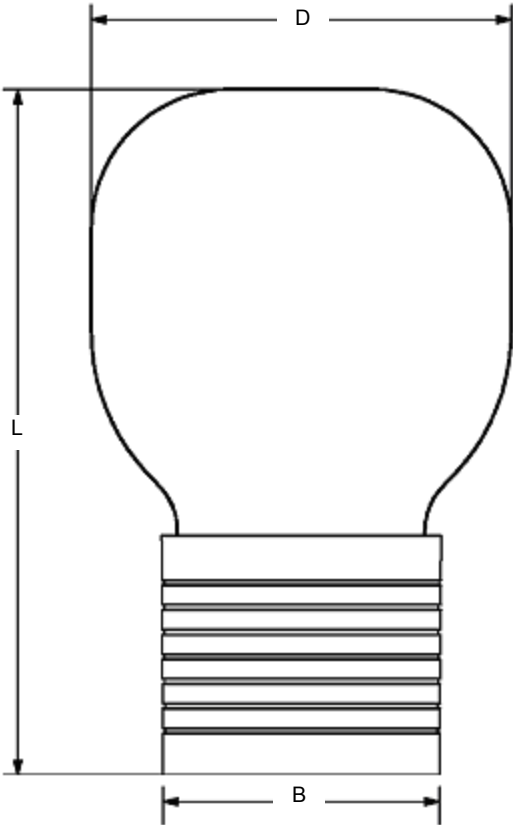
	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS A110, A130 and A140 shaped, internally coupled, a-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets. The diagram shows a side view of an induction lamp. It has a bulbous upper body and a cylindrical base with horizontal ridges. Dimension lines indicate: 'D' for the maximum diameter of the bulbous part, 'L' for the total length from the top of the bulb to the bottom of the base, and 'B' for the diameter of the base.	
Texte français au verso French text overleaf	62639-IEC-03-1	

	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS G95 shaped, internally coupled, b-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets. 	
Texte français au verso French text overleaf	62639-IEC-04-1	

	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS PS110 shaped, internally coupled, b-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.	
Texte français au verso French text overleaf	62639-IEC-05-1	

	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS PS180 shaped, internally coupled, b-type	
These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.  The diagram shows a side profile of a PS180 shaped induction lamp. It features a bulbous upper section and a wider, stepped base. Three dimensions are indicated: 'D' is the horizontal diameter of the upper bulbous section; 'L' is the vertical height from the top of the bulbous section to the top of the base; and 'B' is the horizontal width of the base.		
Texte français au verso French text overleaf	62639-IEC-06-1	

	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS R160 shaped, internally coupled, b-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.  The diagram shows a cross-section of a lamp with a bulbous upper body and a stepped base. Dimension D is the horizontal diameter of the bulbous part. Dimension L is the vertical length from the top of the bulbous part to the top of the base. Dimension B is the horizontal width of the base.	
Texte français au verso French text overleaf	62639-IEC-07-1	

	INDUCTION LAMPS DIAGRAMMATIC DATA SHEET FOR LOCATION OF LAMP DIMENSIONS T85 shaped, internally coupled, a-type	
	These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp standard sheets.  The diagram shows a cross-section of a T85 shaped, internally coupled, a-type induction lamp. The lamp has a bulbous upper body and a cylindrical base. Dimension D is the width of the bulbous body. Dimension L is the total height of the lamp. Dimension B is the width of the base. The base is shown with horizontal lines representing internal components.	
Texte français au verso French text overleaf	62639-IEC-08-1	

7.2 Lamp data sheets

Lamp data sheets are in the order:

- 1) Shape: (a) round, elliptical, parabolic; (b) rectangular; (c) circular
- 2) Power, starting with the lowest power

Sheet-No 62639-IEC-	Power		Frequency	Shape	Energetic coupling
	Lamp rated	System nominal			
	W		kHz		
0035	30	35	135	G95	Internally b-type
0040	36	40	2 650	T85	Internally a-type
0050	50	55	135	PS110	Internally b-type
0055	47	55	2 650	T85	Internally a-type
0070	63	70	2 650	A110	Internally a-type
0085	78	85	2 650	A110	Internally a-type
0100	90	100	2 650	A130	Internally a-type
0150	135	150	2 650	A140	Internally a-type
0160	150	165	135	R160	Internally b-type
0165	150	165	2 650	A130	Internally a-type
0200	180	200	250	A140	Internally a-type
0260	240	260	135	PS180	Internally b-type
1070	70		250	rectangular	Externally a-type
1075	75		250	rectangular	Externally a-type
1080	80		230	rectangular	Externally a-type
1100	100		250	rectangular	Externally a-type
1105	100		230	rectangular	Externally a-type
1120	120		230	rectangular	Externally a-type
1150	150		250	rectangular	Externally a-type
1200	200		230	rectangular	Externally a-type
2080	80		230	circular	Externally b-type
2100	100		230	circular	Externally b-type
2120	120		230	circular	Externally b-type
2150	150		250	circular	Externally b-type
2200	200		250	circular	Externally b-type

		INDUCTION LAMP DATA SHEET Internally b-type		Page 1	
ILCOS: FSGI-30-95/207					
Nominal system power				W	35
Bulb shape					G95
Dimensions (mm)					
L (height)		D (diameter)		B (diameter lampbase)	
207		95		80	
Lamp electrical characteristics					
Frequency	Rated power	Rated voltage	Starting time (max.)		
kHz	W	V	s		
135	30	300	1		
Test position: Mechanical interface down.					
Information for ballast design					
Starting and operating characteristics; lamp substitution circuit, see Figures D.1c, D.2c and D.3c.					
Duration of ignition pulse		$\Delta t_{\min}$	ms	40	
Stop of ignition*		$t_{\max}$	s	5	
Ignition voltage		$U_{\min}$	V_{peak}	1 600	
Magnetising inductance of the 1 core at 25 °C		L_{em}	μH	$164 \pm 5 \%$	
Resistance during operation		$R_{\text{d op}}$	Ω	1 400	
Information for luminaire design					
Maximum lamp ambient temperature (for coupling purpose)			$t_{\text{a max.}}$	°C	60
* On-time 80 ms $\pm$ 40 ms, off-time 1 300 ms $\pm$ 700 ms. Repetition 3 times.					
Texte français au verso French text overleaf		62639-IEC-0035-1			

	INDUCTION LAMP DATA SHEET Internally a-type		Page 1
ILCOS: not commercially available			
Nominal system power		W	40
Bulb shape		T85	
Dimensions (mm)			
L	D	B (diameter lamp cap)	
150 ± 2	85 ± 1	58 ± 0,5	
Lamp electrical characteristics			
Frequency kHz	Rated power W	Rated voltage V	Starting time (max.) s
2 650 ± 0,3 %	36	220 ± 20	0,5
Test position: Mechanical interface down.			
Information for ballast design			
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b			
Duration of ignition pulse	$\Delta t_{\min}$	ms	100
Stop of ignition	$t_{\max}$	s	2
Ignition voltage	$U_{\min}$	V_{peak}	1 500
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	15 ± 0,5
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	56 ± 5
Operating characteristics; lamp substitution circuit for operating, see Figures D.1.b and D.3b			
Equivalent arc resistance @ 2,65 MHz (during operation)	E_{AR}	Ω	205
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	E_{AL}	μH	9,0
Information for luminaire design			
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	60
Texte français au verso French text overleaf	62639-IEC-0040-1		

INDUCTION LAMP DATA SHEET Internally b-type		Page 1	
ILCOS: FSGI-50-110/213			
Nominal system power		W	55
Bulb shape		PS110	
Dimensions (mm)			
L (height)	D (diameter)	B (diameter lampbase)	
213	110	80	
Lamp electrical characteristics			
Frequency	Rated power	Rated voltage	Starting time (max.)
kHz	W	V	s
135	50	350	1
Test position: Mechanical interface down.			
Information for ballast design			
Starting and operating characteristics; lamp substitution circuit, see Figures D.1c, D.2c and D.3c.			
Duration of ignition pulse	$\Delta t_{\min}$	ms	40
Stop of ignition*	$t_{\max}$	s	2
Ignition voltage	$U_{\min}$	V_{peak}	1 600
Magnetising inductance of the 1 core at 25 °C	L_{em}	μH	$158 \pm 5 \%$
Resistance during operation	$R_{\text{d op}}$	Ω	700
Information for luminaire design			
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	50
* On-time 80 ms $\pm$ 40 ms, off-time 400 ms $\pm$ 300 ms. Repetition 3 times.			
Texte français au verso French text overleaf	62639-IEC-0050-1		

	INDUCTION LAMP DATA SHEET Internally a-type			Page 1
ILCOS: FSI-55-146/85/56				
Nominal system power			W	55
Bulb shape			T85	
Dimensions (mm)				
L		D		B
146,5 ± 2,0		85 ± 1		56 ± 0,3
Lamp electrical characteristics				
Frequency kHz	Rated power W	Rated voltage V	Starting time (max.) s	
2 650 ± 10 %	47 ± 5	120 ± 15	2	
Test position: Mechanical interface down.				
Information for ballast design				
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b				
Duration of ignition pulse	$\Delta t_{\min}$	ms	100	
Stop of ignition	$t_{\max}$	s	2	
Ignition voltage	$U_{\min}$	V_{peak}	1 100	
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35	
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	19,5 ± 1,5	
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	56 ± 6	
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b				
Equivalent arc resistance @ 2,65 MHz (during operation)	EAR	Ω	209	
Equivalent arc inductance EAL @ 2,6 5MHz (during operation)	EAL	μH	8,9	
Information for luminaire design				
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	50	
Texte français au verso French text overleaf	62639-IEC-0055-1			

	INDUCTION LAMP DATA SHEET Internally a-type			Page 1
ILCOS: not commercially available				
Nominal system power			W	70
Bulb shape			A110	
Dimensions (mm)				
L		D	B (diameter lamp cap)	
182 ± 2		110 ± 1,5	58 ± 0,5	
Lamp electrical characteristics				
Frequency kHz	Rated power W	Rated voltage V	Starting time (max.) s	
2 650 ± 0,3 %	63	220 ± 20	0,5	
Test position: Mechanical interface down.				
Information for ballast design				
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b				
Duration of ignition pulse	$\Delta t_{\min}$	ms	100	
Stop of ignition	$t_{\max}$	s	2	
Ignition voltage	$U_{\min}$	V_{peak}	1 500	
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35	
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	15 ± 0,5	
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	56 ± 5	
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b				
Equivalent arc resistance @ 2,65 MHz (during operation)	EAR	Ω	225	
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	EAL	μH	9,0	
Information for luminaire design				
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	60	
Texte français au verso French text overleaf	62639-IEC-0070-1			

	INDUCTION LAMP DATA SHEET Internally a-type			Page 1
ILCOS: FSI-85-186/110/56				
Nominal system power			W	85
Bulb shape			A110	
Dimensions (mm)				
L		D		B
186,5 ± 2,0		110 ± 1		56 ± 0,3
Lamp electrical characteristics				
Frequency kHz	Rated power W	Rated voltage V	Starting time (max.) s	
2 650 ± 10 %	78 ± 8	180 ± 20	2	
Test position: Mechanical interface down.				
Information for ballast design				
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b				
Duration of ignition pulse	$\Delta t_{\min}$	ms	100	
Stop of ignition	$t_{\max}$	s	2	
Ignition voltage	$U_{\min}$	V_{peak}	1 100	
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35	
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	19,5 ± 1,5	
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	56 ± 6	
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b				
Equivalent arc resistance @ 2,65 MHz (during operation)	EAR	Ω	232	
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	EAL	μH	10,6	
Information for luminaire design				
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	50	
Texte français au verso French text overleaf	62639-IEC-0085-1			

	INDUCTION LAMP DATA SHEET Internally a-type		Page 1
ILCOS: not commercially available			
Nominal system power		W	100
Bulb shape		A130	
Dimensions (mm)			
L	D	B (diameter lamp cap)	
207 ± 2	130 ± 1,5	58 ± 0,5	
Lamp electrical characteristics			
Frequency kHz	Rated power W	Rated voltage V	Starting time (max.) s
2 650 ± 0,3 %	90	220 ± 20	0,5
Test position: Mechanical interface down.			
Information for ballast design			
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b			
Duration of ignition pulse	$\Delta t_{\min}$	ms	100
Stop of ignition	$t_{\max}$	s	2
Ignition voltage	$U_{\min}$	V_{peak}	1 500
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	14 ± 0,5
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	56 ± 5
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b			
Equivalent arc resistance @ 2,65 MHz (during operation)	E_{AR}	Ω	225
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	E_{AL}	μH	9,0
Information for luminaire design			
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	60
Texte français au verso French text overleaf	62639-IEC-0100-1		

INDUCTION LAMP DATA SHEET Internally a-type		Page 1	
ILCOS: not commercially available			
Nominal system power		W	150
Bulb shape		A140	
Dimensions (mm)			
L	D	B (diameter lamp cap)	
233 ± 2	140 ± 2	67 ± 0,5	
Lamp electrical characteristics			
Frequency	Rated power	Rated voltage	Starting time (max.)
kHz	W	V	s
2 650 ± 0,3 %	135	220 ± 20	1
Test position: Mechanical interface down.			
Information for ballast design			
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b			
Duration of ignition pulse	$\Delta t_{\min}$	ms	100
Stop of ignition	$t_{\max}$	s	2
Ignition voltage	$U_{\min}$	V_{peak}	1 500
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35
Inductivity @ 2,65 MHz (power coupler substitution circuit)	L_{PC}	μH	14 ± 0,5
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	65 ± 5
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b			
Equivalent arc resistance @ 2,65 MHz (during operation)	EAR	Ω	200
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	EAL	μH	9,0
Information for luminaire design			
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	60
Texte français au verso French text overleaf	62639-IEC-0150-1		

		INDUCTION LAMP DATA SHEET Internally b-type		Page 1	
ILCOS: FSGI-150-160/213					
Nominal system power				W	165
Bulb shape				R160	
Dimensions (mm)					
L (height)		D (diameter)		B (diameter lampbase)	
213		160		73,4	
Lamp electrical characteristics					
Frequency	Rated power	Rated voltage	Starting time (max.)		
kHz	W	V	s		
135	150	450	1		
Test position: Mechanical interface down.					
Information for ballast design					
Starting and operating characteristics; lamp substitution circuit, see Figures D.1c, D.2c and D.3c.					
Duration of ignition pulse		$\Delta t_{\min}$	ms	80	
Stop of ignition*		$t_{\max}$	s	8	
Ignition voltage		$U_{\min}$	V_{peak}	1 600	
Magnetising inductance of the 1 core at 25 °C		L_{em}	μH	$160 \pm 7 \%$	
Resistance during operation		$R_{\text{d op}}$	Ω	525	
Information for luminaire design					
Maximum lamp ambient temperature (for coupling purpose)			$t_{\text{a max.}}$	°C	50
* On-time 100 ms $\pm$ 20 ms, off-time 500 ms $\pm$ 200 ms. Repetition 3 to 10 times.					
Texte français au verso French text overleaf		62639-IEC-0160-1			

	INDUCTION LAMP DATA SHEET Internally a-type			Page 1
ILCOS: not commercially available				
Nominal system power			W	165
Bulb shape			A130	
Dimensions (mm)				
L		D		B (cap diameter)
210,5 ± 3,0		130 ± 1		56 ± 0,3
Lamp electrical characteristics				
Frequency	Rated power	Rated voltage	Starting time (max.)	
kHz	W	V	s	
2 650 ± 10 %	150 ± 15	230 ± 50	2	
Test position: Mechanical interface down.				
Information for ballast design				
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b				
Duration of ignition pulse	$\Delta t_{\min}$	ms	100	
Stop of ignition	$t_{\max}$	s	2	
Ignition voltage	$U_{\min}$	V_{peak}	1 100	
Equivalent serial resistance @ 2,65 MHz	Q-factor		> 35	
Inductivity @ 0,10 MHz (power coupler substitution circuit)	L_{PC}	μH	11,5 ± 0,4	
Capacitance @ 8,0 MHz (power coupler substitution circuit)	C_{PC}	pF	70 ± 4	
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b				
Equivalent arc resistance @ 2,65 MHz (during operation)	EAR	Ω	172	
Equivalent arc inductance EAL @ 2,65 MHz (during operation)	EAL	μH	9,2	
Information for luminaire design				
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C	50	
NOTE In Korea, lamps with different dimensions (L = 233 mm, D = 140 mm, B = 67 mm, C = 63 mm) are in the market. Tolerances are assumed the same as for the standard lamp.				
Texte français au verso French text overleaf		62639-IEC-0165-1		

	INDUCTION LAMP DATA SHEET Internally a-type			Page 1
ILCOS: not commercially available				
Nominal system power			W	200
Bulb shape			A140	
Dimensions (mm)				
L		D		B (cap diameter)
233 ± 2		140 ± 2		67 ± 0,5
Lamp electrical characteristics				
Frequency kHz		Rated power W	Rated voltage V	Starting time (max.) s
250 ± 0,3 %		180	220 ± 20	2
Test position: Mechanical interface down.				
Information for ballast design				
Starting characteristics; lamp substitution circuit for starting, see Figures D.1b and D.2b				
Duration of ignition pulse			$\Delta t_{\min}$	ms 50
Stop of ignition			$t_{\max}$	s 2
Ignition voltage			$U_{\min}$	V_{peak} 2 000
Equivalent serial resistance @ 2,65 MHz			Q-factor	-
Inductivity @ 0,10 MHz (power coupler substitution circuit)			L_{PC}	μH -
Capacitance @ 8,0 MHz (power coupler substitution circuit)			C_{PC}	pF -
Operating characteristics; lamp substitution circuit for operating, see Figures D.1b and D.3b				
Equivalent arc resistance @ 2,65 MHz (during operation)			EAR	Ω -
Equivalent arc inductance EAL @ 2,65 MHz (during operation)			EAL	μH -
Information for luminaire design				
Maximum lamp ambient temperature (for coupling purpose)			$t_{\text{a max.}}$	°C 60
Texte français au verso French text overleaf		62639-IEC-0200-1		

	INDUCTION LAMP DATA SHEET Internally b-type	Page 1
ILCOS: FSGI-240-180/326		
Nominal system power		W 260
Bulb shape		PS180
Dimensions (mm)		
L (height)	D (diameter)	B (diameter lampbase)
325,5	180	140
Lamp electrical characteristics		
Frequency kHz	Rated power W	Rated voltage V
135	240	350
		Starting time (max.) s
		1
Test position: Mechanical interface down.		
Information for ballast design		
Starting and operating characteristics; lamp substitution circuit, see Figures D.1c, D.2c and D.3c		
Duration of ignition pulse	$\Delta t_{\min}$	ms 30
Stop of ignition*	$t_{\max}$	s 7
Ignition voltage	$U_{\min}$	V _{peak} 1 600
Magnetising inductance of the 1 core at 25 °C	L_{em}	μH 194 ± 7 %
Resistance during operation	$R_{\text{d op}}$	Ω 320
Information for luminaire design		
Maximum lamp ambient temperature (for coupling purpose)	$t_{\text{a max.}}$	°C 50
* On-time 50 ms ± 20 ms, off-time 500 ms ± 200 ms. Repetition 3 to 10 times.		
Texte français au verso French text overleaf	62639-IEC-0260-1	

		INDUCTION LAMP						Page 1	
		DATA SHEET							
		Externally a-type							
ILCOS: FSI-70-54/137,5/250									
Nominal lamp power							W	70	
Bulb shape							Rectangular		
Dimensions (mm)									
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂
250±1,2	max.315	129,5±3,7	82,0±2,7	min.105	137,5±1,5	54±1	5,1±0,2	≥10	73±2
Lamp electrical characteristics									
Frequency		Rated power		Rated voltage		Rated current		Starting time (max.)	
kHz		W		V		A		s	
250 ± 25		72 ± 2,9		145 ± 5		0,52		2	
Test position: horizontal.									
Information for ballast design									
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a									
Duration of ignition pulse						Δt _{min}	ms	50	
Stop of ignition						t _{max}	s	2	
Ignition voltage						U _{min}	V _{r.m.s.}	800	
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	500 ± 28 %	
Resistance during operation						R _{d op}	Ω	300	
Information for luminaire design									
Maximum lamp ambient temperature at start (for coupling purpose)							t _{a max.}	°C	50
NOTE The magnetising inductance during operation at −40 °C to 150 °C can be 200 μH to 1 500 μH.									
Texte français au verso French text overleaf		62639-IEC-1070-1							

		INDUCTION LAMP DATA SHEET Externally a-type				Page 1			
ILCOS: not commercially available									
Nominal lamp power						W	75		
Bulb shape						Rectangular			
Dimensions (mm)									
L_1	L_2	L_3	L_4	L_5	W	D	S	H_1	H_2
200	263	78	83	62	133	52	5	14	74
Lamp electrical characteristics									
Frequency		Rated power		Rated voltage		Rated current		Starting time (max.)	
kHz		W		V		A		s	
250 ± 1 %		75 ± 5		130		-		2	
Test position: unknown									
Information for ballast design									
Starting and operating characteristics; lamp substitution circuit, see Figures D.1a, D.2a and D.3a									
Duration of ignition pulse						$\Delta t_{\min}$	ms	50	
Stop of ignition						$t_{\max}$	s	2	
Ignition voltage						$U_{\min}$	V _{peak}	1 300	
Magnetising inductance of the 2 cores at 25 °C						L_{em}	μH	450 ± 25 %	
Resistance during operation						$R_{\text{d op}}$	Ω	230	
Information for luminaire design									
Maximum lamp ambient temperature at start (for coupling purpose)						$t_{\text{a max.}}$	°C	60	
NOTE The magnetising inductance during operation at –40 °C to 150 °C is unknown.									
Texte français au verso French text overleaf		62639-IEC-1075-1							

	INDUCTION LAMP DATA SHEET Externally a-type								Page 1	
ILCOS: not commercially available										
Nominal lamp power								W	80	
Bulb shape								Rectangular		
Dimensions (mm)										
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂	
-	287	-	-	-	145	-	-	-	95	
Lamp electrical characteristics										
Frequency		Rated power		Rated voltage		Rated current		Starting time (max.)		
kHz		W		V		A		s		
230 ± 1 %		80 ± 5		135		0,6		0,1		
Test position: unknown										
Information for ballast design										
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a										
Duration of ignition pulse						Δt _{min}	ms	50		
Stop of ignition						t _{max}	s	2		
Ignition voltage						U _{min}	V _{peak}	1 030		
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	450 ± 25 %		
Resistance during operation						R _{d op}	Ω	250		
Information for luminaire design										
Maximum lamp ambient temperature at start (for coupling purpose)							t _{a max.}	°C	60	
NOTE The magnetising inductance during operation at −40 °C to 150 °C is unknown.										
Texte français au verso French text overleaf		62639-IEC-1080-1								

	INDUCTION LAMP DATA SHEET Externally a-type							Page 1	
ILCOS: FSI-100-54/137,5/250									
Nominal lamp power							W	100	
Bulb shape							Rectangular		
Dimensions (mm)									
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂
250±1,2	≤315	129,5±3,7	82,0±2,7	≥105	137,5±1,5	54±1	5,1±0,2	≥10	73±2
Lamp electrical characteristics									
Ballast type	Frequency kHz	Rated power W		Rated voltage V		Rated current A		Starting time (max.) s	
100 W	250 ± 25	96 ± 3,8		195 ± 7		0,52		2	
150 W	250 ± 25	138 ± 5,5		173 ± 6,0		0,832		2	
Test position: horizontal.									
Information for ballast design									
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a									
Duration of ignition pulse						Δt _{min}	ms	50	
Stop of ignition						t _{max}	s	2	
Ignition voltage						U _{min}	V _{r.m.s.}	800	
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	500 ± 28 %	
Resistance during operation, 100 W type ballast						R _{d op}	Ω	412	
Resistance during operation, 150 W type ballast						R _{d op}	Ω	221	
Information for luminaire design									
Maximum lamp ambient temperature at start (for coupling purpose)							t _{a max.}	°C	50
NOTE The magnetising inductance during operation at –40 °C to 150 °C can be 200 μH to 1 500 μH.									
Texte français au verso French text overleaf		62639-IEC-1100-1							

	INDUCTION LAMP DATA SHEET Externally a-type	Page 1
ILCOS: not commercially available		
Nominal lamp power		W
		100
Bulb shape		Rectangular
Dimensions (mm)		
L_1	L_2	L_3
L_4	L_5	W
D	S	H_1
H_2		
$250 \pm 1,2$	313	$129,5 \pm 3,7$
$82,0 \pm 2,7$	112	145
53	$5,1 \pm 0,2$	14
95		
Lamp electrical characteristics		
Frequency	Rated power	Rated voltage
kHz	W	V
Rated current	Starting time (max.)	
A	s	
$230 \pm 10 \%$	100 ± 7	145
0,7	2	
Test position: unknown		
Information for ballast design		
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a		
Duration of ignition pulse	$\Delta t_{\min}$	ms
50		
Stop of ignition	$t_{\max}$	s
2		
Ignition voltage	$U_{\min}$	V _{peak}
1 500		
Magnetising inductance of the 2 cores at 25 °C	L_{em}	μH
$500 \pm 28 \%$		
Resistance during operation	$R_{d\ op}$	Ω
400 ± 15		
Information for luminaire design		
Maximum lamp ambient temperature at start (for coupling purpose)		$t_{a\ max.}$ °C
		50
NOTE The magnetising inductance during operation at –40 °C to 150 °C is unknown.		
Texte français au verso French text overleaf	62639-IEC-1105-1	

	INDUCTION LAMP DATA SHEET Externally a-type								Page 1	
ILCOS: not commercially available										
Nominal lamp power								W	120	
Bulb shape								Rectangular		
Dimensions (mm)										
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂	
-	357	-	-	-	143	-	-	-	95	
Lamp electrical characteristics										
Frequency		Rated power		Rated voltage		Rated current		Starting time (max.)		
kHz		W		V		A		s		
230 ± 1 %		120 ± 8		165		0,68		0,1		
Test position: unknown										
Information for ballast design										
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a										
Duration of ignition pulse						Δt _{min}	ms	50		
Stop of ignition						t _{max}	s	2		
Ignition voltage						U _{min}	V _{peak}	1 200		
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	450 ± 25 %		
Resistance during operation						R _{d op}	Ω	190		
Information for luminaire design										
Maximum lamp ambient temperature at start (for coupling purpose)							t _{a max.}	°C	60	
NOTE The magnetising inductance during operation at −40 °C to 150 °C is unknown.										
Texte français au verso French text overleaf		62639-IEC-1120-1								

		INDUCTION LAMP DATA SHEET Externally a-type						Page 1		
ILCOS: FSI-150-54/137,5/350										
Nominal lamp power								W	150	
Bulb shape								Rectangular		
Dimensions (mm)*										
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂	
350±1,2	≤415	229,5±3,7	82,0±2,7	≥205	137,5±1,5	54±1	5,1±0,2	≥10	73±2	
Lamp electrical characteristics										
Frequency		Rated power		Rated voltage*		Rated current		Starting time (max.)		
kHz		W		V		A		s		
250 ± 25		144 ± 5,8		182 ± 6,5		0,832		2		
Test position: horizontal.										
Information for ballast design										
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a										
Duration of ignition pulse						Δt _{min}	ms	50		
Stop of ignition						t _{max}	s	2		
Ignition voltage*						U _{min}	V _{r.m.s.}	1 000		
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	500 ± 28 %		
Resistance during operation*						R _{d op}	Ω	235		
Information for luminaire design										
Maximum lamp ambient temperature at start (for coupling purpose)								t _{a max.}	°C	50
NOTE The magnetising inductance during operation at –40 °C to 150 °C can be 200 μ to 1 500 μH.										
* In Korea, W = 143 mm, H2 = 95 mm; rated voltage = 170 V. Tolerances are not available. Required ignition voltage 2 200 V _{peak} and R _{d op} = 250 Ω.										
Texte français au verso French text overleaf		62639-IEC-1150-1								

	INDUCTION LAMP DATA SHEET Externally a-type								Page 1	
ILCOS: not commercially available										
Nominal lamp power								W	200	
Bulb shape								Rectangular		
Dimensions (mm)										
L ₁	L ₂	L ₃	L ₄	L ₅	W	D	S	H ₁	H ₂	
425	495	282	98	262	148	58	5	22	90	
Lamp electrical characteristics										
Frequency		Rated power		Rated voltage		Rated current		Starting time (max.)		
kHz		W		V		A		s		
230 ± 10 %		200 ± 13		205		0,98		2		
Test position: unknown										
Information for ballast design										
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a										
Duration of ignition pulse						Δt _{min}	ms	50		
Stop of ignition						t _{max}	s	2		
Ignition voltage						U _{min}	V _{r.m.s.}	2 200		
Magnetising inductance of the 2 cores at 25 °C						L _{em}	μH	450 ± 25		
Resistance during operation						R _{d op}	Ω	200		
Information for luminaire design										
Maximum lamp ambient temperature at start (for coupling purpose)							t _{a max.}	°C	60	
NOTE The magnetising inductance during operation at –40 °C to 150 °C is unknown.										
Texte français au verso French text overleaf		62639-IEC-1200-1								

	INDUCTION LAMP DATA SHEET Externally b-type			Page 1	
ILCOS: not commercially available					
Nominal lamp power			W	80	
Bulb shape			Circular		
Dimensions (mm)					
H		L		W	
93		232		217	
Lamp electrical characteristics					
Frequency	Rated power	Rated voltage	Rated current	Starting time (max.)	
kHz	W	V	A	s	
230	80	135	0,6	0,1	
Test position: unknown					
Information for ballast design					
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a					
Duration of ignition pulse			$\Delta t_{\min}$	ms	50
Stop of ignition			$t_{\max}$	s	2
Ignition voltage			$U_{\min}$	V _{r.m.s.}	2 200
Magnetising inductance of the 2 cores at 25 °C			L_{em}	μH	450 ± 25
Resistance during operation			$R_{\text{d op}}$	Ω	250
Information for luminaire design					
Maximum lamp ambient temperature at start (for coupling purpose)			$t_{\text{a max.}}$	°C	60
NOTE The magnetising inductance during operation at −40 °C to 150 °C is unknown.					
Texte français au verso French text overleaf	62639-IEC-2080-1				

	INDUCTION LAMP DATA SHEET Externally b-type				Page 1	
ILCOS: not commercially available						
Nominal lamp power				W	100	
Bulb shape				Circular		
Dimensions (mm)						
H		L		W		
93		232		217		
Lamp electrical characteristics						
Frequency	Rated power	Rated voltage	Rated current	Starting time (max.)		
kHz	W	V	A	s		
230	100	144	0,7	0,1		
Test position: unknown						
Information for ballast design						
Starting and operating characteristics; lamp substitution circuit, see Figure D.1a, D.2a and D.3a						
Duration of ignition pulse			$\Delta t_{\min}$	ms	50	
Stop of ignition			$t_{\max}$	s	2	
Ignition voltage			$U_{\min}$	V _{r.m.s.}	2 200	
Magnetising inductance of the 2 cores at 25 °C			L_{em}	μH	450 ± 25	
Resistance during operation			$R_{\text{d op}}$	Ω	250	
Information for luminaire design						
Maximum lamp ambient temperature at start (for coupling purpose)				$t_{\text{a max.}}$	°C	60
NOTE The magnetising inductance during operation at −40 °C to 150 °C is unknown.						
Texte français au verso French text overleaf		62639-IEC-2100-1				