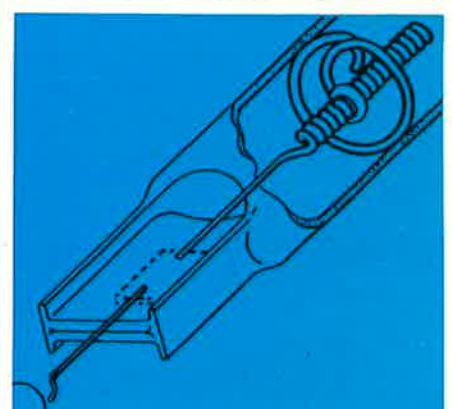
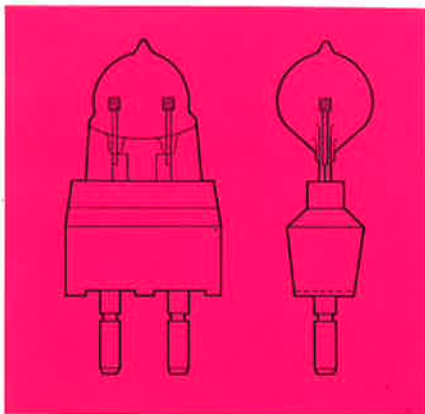




Thorn Studio Lamps Handbook



Studio Lamps

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Ellipsoidal Mirror Spotlights

A 2w Lamp has now been developed specially for use in ellipsoidal mirror spotlights. The lamp reference CP56 is of the 'Studio' Type and operates at 3200° K. It is intended for use in only those types of ellipsoidal Mirror Spotlights where a long neck is essential to avoid a partial obscuration of the reflected beam.

It is not recommended for use in fresnel type luminaires for which the CP41 is more suitable.

CP41

This lamp is designed primarily for use in fresnel type luminaires and other general service.

It is not recommended for use in ellipsoidal mirror type spotlights where an obscuration of the reflected beam may overheat the seal and cap assembly; the CP56 lamp has been specially developed for this latter application.

Important Operating Notes

1 Handling precautions

Lamps with quartz envelopes should not be handled without suitable precautions. If accidentally touched with the skin, the lamp must be cleaned with alcohol applied with a soft clean cloth. Failure to observe this precaution will permanently mark the bulb. Always use the polythene glove packed with the lamp when installing.

2 Operating precautions

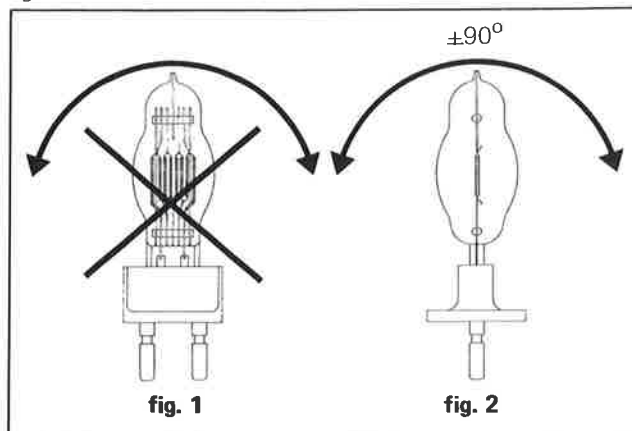
All lamps in this catalogue should be operated with a series fuse in the circuit, as shown in Table 12.

Lamps of quartz construction use a gas filling at a pressure higher than atmospheric, and as the lamp can in rare instances shatter in use, suitable shielding techniques should be employed where appropriate. Also protect the lamp from mishandling, scratches and abrasions, and do not operate at above correct rated voltage.

3 Operating position

The correct operating position for the lamps in this catalogue are included in the specifications given. These should be observed to ensure optimum performance and life.

In all cases permitted burning angles refer only to orientation in the vertical plane at right angles to the normal V.B.D. filament plane, see fig. 2. Angled burning by rotation in the plane of the filament is not permitted, see fig. 1.



Introduction

CP Range of Lamps for fresnal spotlight fittings

As the result of extensive and sustained development work, much of it original, Thorn Lighting are now able to offer a comprehensive range of lamps operating on the Tungsten Halogen principle and of quartz construction, for all Television, Studio 'Motion' picture and Theatre lighting purposes.

The range of lamps available is now so wide that it has been unnecessary to continue to supply lamps with glass envelopes for film and television studio lighting purposes. However, Thorn continue to supply both conventional glass and quartz halogen lamps for Theatre lighting.

Thorn have been strongly supported by the television and film industries in their decision to discontinue glass lamps for studio lighting purposes. This is because the

industry has been quick to appreciate not only the financial advantages of quartz halogen lamps, but also their superiority from the point of view of reliability and virtually constant colour temperature.

The increase in the use of the lamps we now manufacture is due to the Thorn policy of supplying direct replacement quartz halogen lamps for those glass studio lamps in common use simultaneously with the development of original types. These exploit the important advantages of compact size offered by quartz halogen construction.

As a result Thorn are now able to supply direct replacement quartz halogen lamps for use in fresnal and spotlight fittings of from 500 watts to 10,000 watts. These lamps employ a wide range of commonly accepted bases.

Lamp	Watts	Volts*	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)
CP39	650	115/120, 220, 240	G22	63.5	2. 1/2	100
CP51	650	115/120, 220, 240	P28	55.5	2. 3/16	100
CP40	1,000	115/120, 220, 240	G22	63.5	2. 1/2	200
CP52	1,000	115/120, 220, 240	P28	55.5	2. 3/16	200
CP41	2,000	115/120, 220, 240	G38	127.0	5	400
CP53	2,000	115/120, 220, 240	P40	87.0	3. 7/16	400
CP29	5,000	115/120, 220, 240	G38	165.0	6. 1/2	400
CP54	10,000	220, 240	G38	254.0	10	400

*Other voltages can usually be supplied to special order.

Thorn also offer a similarly comprehensive range of lamps of original design which give fittings manufacturers more compact lamps and permit the construction of smaller

lighter and more efficient luminaires. This range comprises the following lamps:—

Lamp	Watts	Volts*	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)
CP23	650	115/120, 220, 240	GX9.5	55.0	2. 5/32	100
CP24	1,000	115/120, 220, 240	GX9.5	55.0	2. 5/32	200
CP43	2,000	115/120, 220, 240	GY16	70.0	2. 3/4	400
CP55	2,000	115/120, 220, 240	G22	75.0	3	400

*Other voltages can usually be supplied to special order.

2kw Lamp for Ellipsoidal Spotlights

A problem is encountered with some ellipsoidal spotlight luminaires due to the fact that a portion of the reflected beam of light is directed onto the the cap of 2kw CP lamps designed for fresnal fittings. This leads to overheating of the cap and seal which may result in premature lamp failure.

Thorn have therefore designed a 2kw lamp intended

for use in ellipsoidal spotlights where the size of the cap has been reduced and the neck length correspondingly increased, thus removing the critical seal area from the reflected radiation and ensuring that optimum lamp life is obtained. The lamp developed for this application is the CP56.

Lamp	Watts	Volts	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)	Colour Temp. K
CP56	2,000	115/120, 220, 240	G38	127.00	5.0	400	3200° K

Twin filament CP Lamps

Twin filament lamps greatly increase the versatility and flexibility of television studio fittings and luminaires employing them are now standard equipment in many major studios. Lamps of this type also have the considerable advantage of being capable of operation at 25% of full

output without unacceptable shift in colour temperature. Again quartz halogen construction gives long life and constant performance. Two lamps of this type are available with the following specifications:—

Lamp	Watts	Volts	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)
CP30	1250/1250	115/120, 220, 240	G38q	143.0	5. 5/8	300
CP32	2500/2500	220, 240	G38q	143.0	5. 5/8	300
CP58	1250/2500/3750	220,240	G38q	143.0	5.5/8	300

Hardglass Halogen compared with Quartz Halogen

The tungsten halogen principle is now so well known and documented elsewhere that it is considered unnecessary to describe it here. However, it is important to distinguish between Hard glass lamps that merely have a halogen compound added to the filling gas and lamps such as those enumerated, which are of quartz construction. The former are from the point of view of life and performance identical to conventional glass lamps of the same rating, the halogen only serving to prolong the usefulness of the lamp

by preventing internal blackening due to evaporated tungsten. However, once a lamp is constructed from quartz, with its higher melting point, instead of glass, the designer can make use of the much greater strength of the smaller envelope. It is then possible to increase the filling pressure which by reducing tungsten evaporation from the filament prolongs the life of the lamp to at least twice that of a glass lamp.

Introduction

Linear and 'U' lamps — for studio lighting 3,200°K

Whilst a comprehensive selection of lamps for spotlight fittings is important to the lighting director of almost equal importance is a range suitable for the many different fittings now on the market which use tungsten halogen lamps of tubular construction. Thorn believe their range gives a wide choice and is unmatched in performance and reliability.

The Thorn range of lamps of this type is also exceptional in as much as it offers lamps in an original 'U' shape. Developed by Thorn engineers to meet the demand for high wattage lamps of compact construction, these lamps are widely used in a variety of light weight portable fittings.

Lamp	ANSI Ref.	Watts	Volts	Nom Contact Length	Overall Length (mm)	Overall Length (ins)	Base	Life (Hrs)	Finish*
Linear									
P2/10		625	220/230, 240/250	185.7 ± 1.6	190	7. 1/2	R7s. 15	200	clear
P2/15		625	220/230, 240/250	114.2 ± 1.6	119	4. 11/16	R7s. 15	75	clear/frosted
P2/6	FAD	650	120	74.9 ± 1.6	80	3. 1/8	R7s. 15	100	clear
P2/13	DXX	800	220/230, 240/250	74.9 ± 1.6	80	3. 1/8	R7s. 15	75	clear
P2/14		800	220/230, 240/250	88.4 ± 1.6	93.5	3. 11/16	R7s. 15	75	clear
P2/11		800	220/230, 240/250	114.2 ± 1.6	119	4. 11/16	R7s. 15	150	clear/frosted
P2/7	EKM	1,000	220/230, 240/250	185.7 ± 1.6	190	7. 1/2	R7s. 15	200	clear
P2/12		1,250	220/230, 240/250	185.7 ± 1.6	190	7. 1/2	R7s. 15	200	clear
P2/27	FEX	2,000	220/230, 240	138.45 ± 1.6	143	5. 5/8	RX7s	300	clear
P2/27	FEY	2,000	120	138.45 ± 1.6	143	5. 5/8	RX7s	500	clear
'U' Lamps									
P2/16		650	220/230, 240/250	—	65 max		G 6.35	50	clear
P2/25		800	115/120	—	75 max		G 6.35	50	clear
P2/17		1,000	220/230, 240/250	—	75 max		G 6.35	50	clear
P2/26		1,250	220/230, 240/250	—	75 max		G 6.35	50	clear
Linear									
	DFD	500	120	114.29 ± 1.6	119	4. 11/16	R7s. 15	400	clear
	FDN	500	120	114.29 ± 1.6	119	4. 11/16	R7s. 15	400	frosted
	FCM	1,000	120	114.29 ± 1.6	119	4. 11/16	R7s. 15	500	clear
	FHM	1,000	120	114.29 ± 1.6	119	4. 11/16	R7s. 15	500	frosted
	DYA	1,000	120	103.45 ± 1.6	111	4. 3/8	R7s. 15	150	clear
	DYN	1,000	120	103.45 ± 1.6	111	4. 3/8	R7s. 15	150	frosted

*Lamps normally supplied clear can also be supplied with frosted finish.

Note

Colour Temperature

All the foregoing lamps have been designed for use in conjunction with colour film stock balanced for 3,200°K.

The colour temperature will be virtually constant throughout life.

CP and T class replacement chart showing life of quartz halogen lamps compared with conventional types.

Thorn/Atlas/Ediswan Quartz Halogen

Voltage Range	Watts	Type	Cap	L.C.L. (mm)	Life (hrs)	Replaces Conventional	Life (hrs)
115/120,220,240	650	CP39	G22	63.5	100	CP9,10*	50/35
	650	CP23	GX9.5	55.0	100		
	650	CP51	P28	55.5	100	CP8,11*	50/35
115/120,220,240	1,000	CP40	G22	63.5	200	CP19*	100
	1,000	CP24	GX9.5	55.0	200		
	1,000	CP52	P28	55.5	200		
115/120,220,240	2,000	CP41	G38	127.0	400	CP12*	100
	2,000	CP43	GY16	70.0	400		
	2,000	CP53	P40	87.0	400		
	2,000	CP55	G22	75.0	400		
115/120,220,240	2,000	CP56	G38	127.0	400		
115/120,220,240	5,000	CP29	G38	165.0	400	CP13*	150
	10,000	CP54	G38	254.0	400	CP14*	200
115/120,220,240	1,250/1,250	CP30	G38q	143.0	300		
	2,500/2,500	CP32	G38q	143.0	300		
115/120,220,240	500	T17	P28	55.0	750	T1	200
115/120,220,240	650	T13	P28	55.5	750		
	650	T12	GX9.5	55.0	750		
115/120,220,240	1,000	T11	GX9.5	55.0	750		
	1,000	T14	P28	55.5	750	T6	200
	1,000	T15	P28	88.9	750	T4	200
	1,000	T16	P40	87.0	750	T2	200

*Thorn production discontinued

'T' class lamps for theatre spot light fittings

With this group of lamps Thorn have continued their policy of developing a quartz halogen equivalent for existing glass lamps. There is a quartz halogen replacement lamp for all popular lamps used in theatre spot fittings.

Because these lamps operate at a lower colour temperature than the CP range, the average life that can be

offered now that lamps are available of quartz halogen construction, is a remarkable 750 hours for the entire range. Similar cost savings to those offered by quartz halogen CP lamps are now presented by the quartz halogen 'T' range.

Quartz halogen 'T' class

Lamp	Watts	Volts	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)	Replaces
T17	500	115/120, 220, 240	P28s	55.5	2. 3/16	750	T1
T13	650	115/120, 220, 240	P28s	55.5	2. 3/16	750	T1
T12	650	115/120, 220, 240	GX9.5	55.0	2. 5/32	750	--
T11	1,000	115/120, 220, 240	GX9.5	55.0	2. 5/32	750	--
T14	1,000	115/120, 220, 240	P28s	55.5	2. 3/16	750	T6
T15	1,000	115/120, 220, 240	P28s	88.9	3. 9/16	750	T4
T16	1,000	115/120, 220, 240	P40s	87.0	3. 7/16	750	T2

Thorn continue to manufacture conventional glass lamps for theatre spotlight fittings as shown in the following table:—

Conventional 'T' class

Lamp	Watts	Volts	Cap	L.C.L. (mm)	L.C.L. (ins)	Life (Hrs)
T3	250	220, 240	P28s	55.5	2. 3/16	200
T1	500	220, 240	P28s	55.5	2. 3/16	200
T2	1,000	220, 240	P40s	87.0	3. 7/16	200
T4	1,000	220, 240	P28s	88.9	3. 1/2	200
T6	1,000	220, 240	P28s	55.5	2. 3/16	200

Substitution Guide

Quartz Halogen Europe

64721 7801P
64720 RH653P 6362P

64747 7802P
64745 RH1003P 6363P

64789 5970P
64788 RH2003P 6364P

6379P

T10 64719, 6940P
T9 64744, 6928P

USA
120V
Only

BTP
EGT

CYX

DMY,DPY
DTY

BTL

Hardglass Halogen ** Europe

CP33 6376P 51235

CP49 6376C 50042
CP44 7761P

7796C
CP34 6377P 51503

CP28 6377C 50252

CP46 CP26 6378P 51703
CP50 13111P 51805

CP22
CP20

50055

** Life and performance similar to conventional glass lamps.

Introduction

Thorn 'Compact Source Iodide' Discharge Lamps

This group of lamps known under the generic term of C.S.I. lamps were developed by Thorn some years ago as high efficiency compact source light sources; initially for follow spot fittings and later in the sealed beam version for the illumination of stadia to meet the stringent demands of colour television.

Brief details are included in this booklet as these lamps are now commonly used for location film and television work. Their popularity for this type of work is mainly due to the increasing demand for reliable light weight luminaires which can be used for location filming or O.B. work in colour, with outstanding economy, not only from the point of view of the demand made on generator capacity but also because of initial low cost and relatively long lamp life.

Recent development work now enables Thorn to offer these lamps in "Hot Restrike" versions and this important new feature adds considerably to the versatility of this type of light source and greatly increases its usefulness to the lighting director.

Full specifications of the Thorn C.S.I. Hot Restrike lamps mentioned above can be found in the relative Thorn data sheets (ref. L5/TA and L12/TA). Details of standard versions which have similar operating characteristics are contained in data sheets (ref L28/T and 99-122).

Control gear necessary for the operation of these lamps is available from Thorn Lighting Ltd. and full details will be found in the above data sheets.

1kW Compact Source Iodide Projector Lamp. Standard Lamp ref 99-0221. Hot Restrike ref 99-0421 (Bare Lamp Version)

Ref	Watts	Supply Volts	Arc Volts	Cap	L.C.L. (mm)	L.C.L. (ins)	Light Output (initial)	Life (Hrs)	Lumen Maintenance
99-0421	1000	220 240	70/85	G38	63.5 ± 2	2.5	90,000	200	90%
99-0221	1000	220 240	70/85	G22	63.5 ± 2	2.5	90,000	200	90%

1kW Sealed Beam Compact Source Iodide Lamp. Standard Lamp ref 99-1222 Hot Restrike ref 99-1422

Ref	Watts	Supply Volts	Arc Volts	Cap	Diam (mm)	Diam (ins)	Overall Length	Light Output Initial Peak Beam Candlepower	Life (Hrs)
99-1422 99-1222	1000	220 240	70/85	G38	205	8	175mm (6.89 ins)	1.5 million CDS	1000

Fig. 1a.
Construction of a typical high wattage studio lamp.

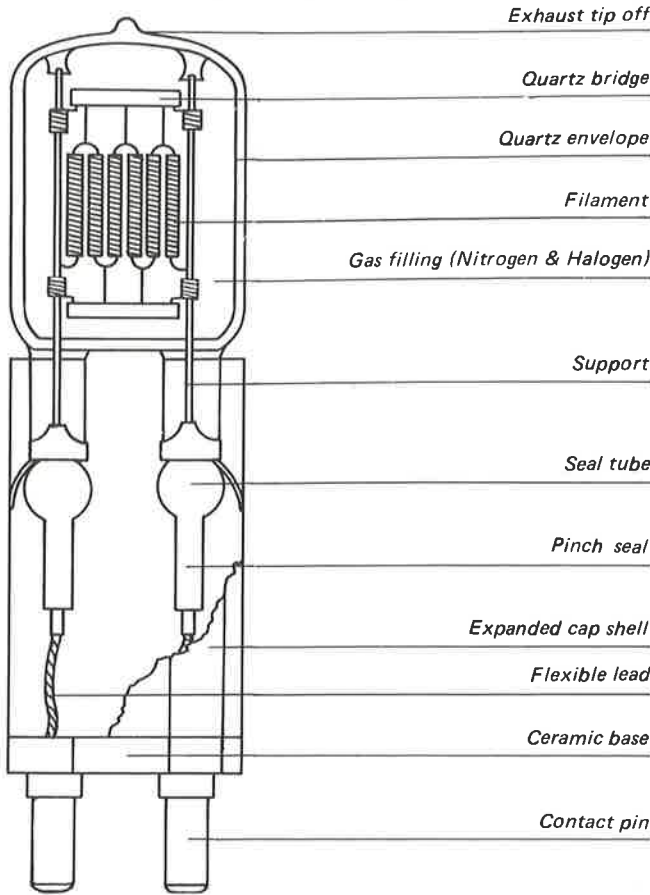


Fig. 1b.
Construction of a typical 4 pin twin filament studio lamp.

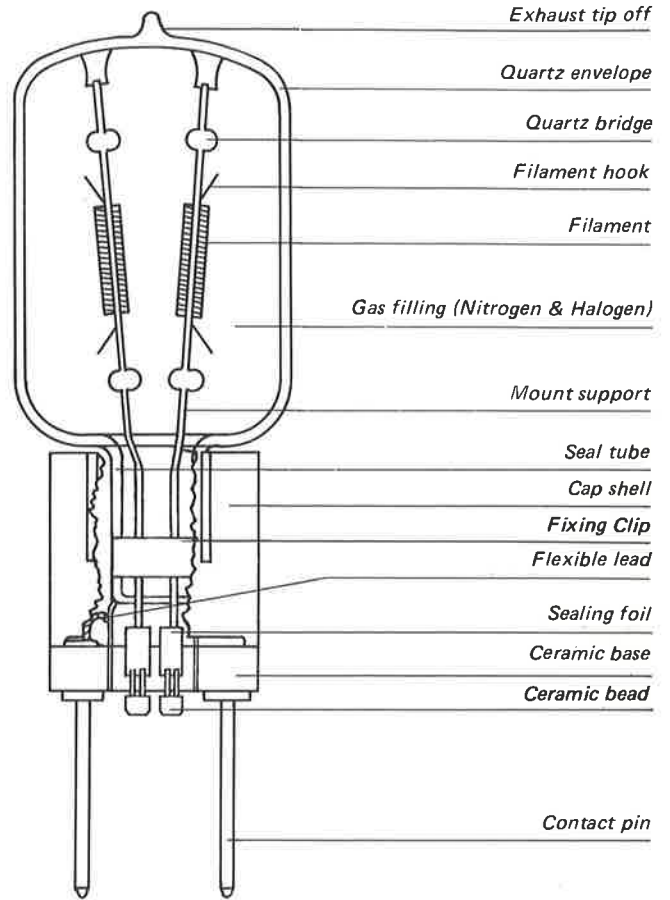


Fig. 1c.
Construction of a typical low wattage theatre class Tungsten Halogen lamp.

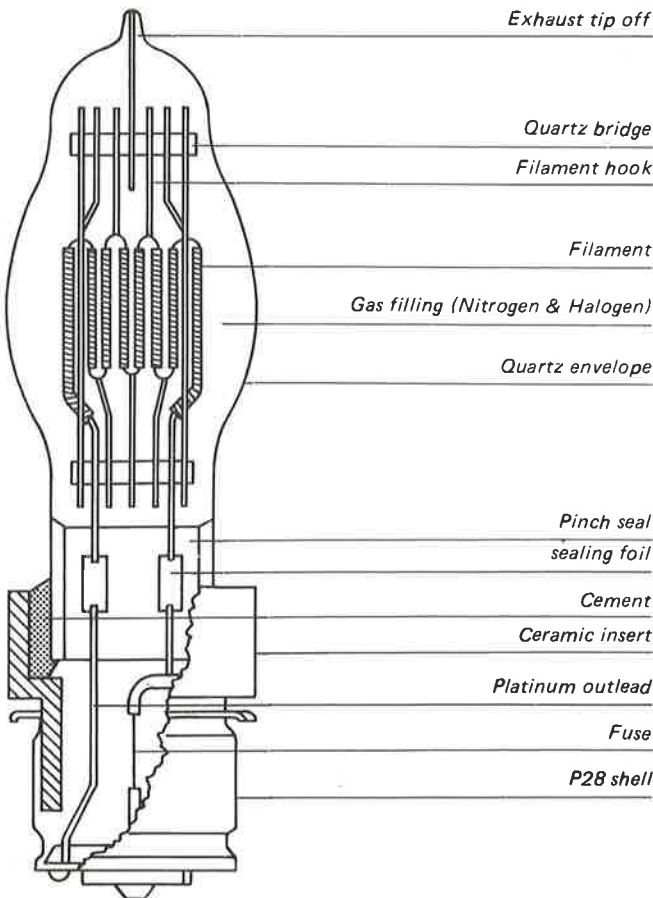


Fig. 1d.
Construction of end section of a typical Quartz Linear Tungsten Halogen Photographic lamp.

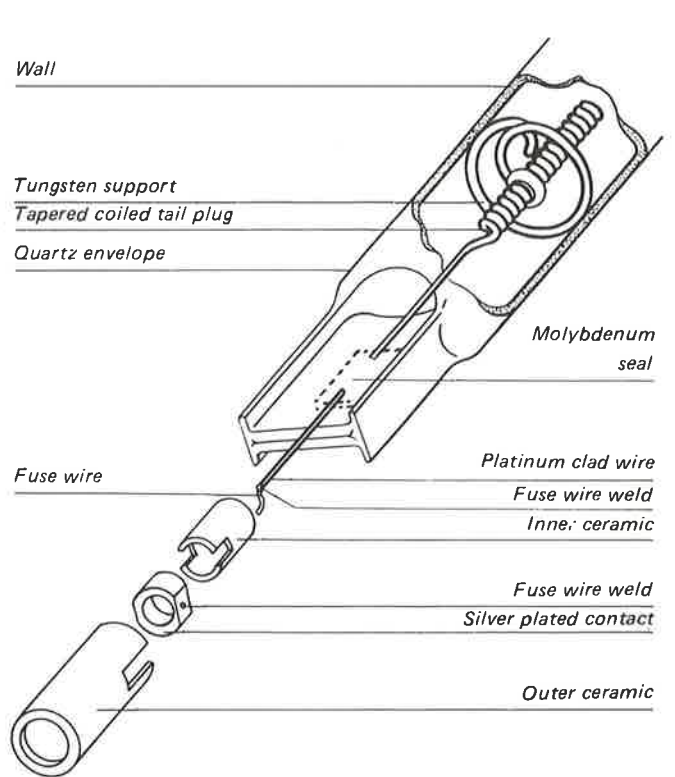


Fig. 2.
Variation of light output and wattage with applied voltage for a typical studio lamp.

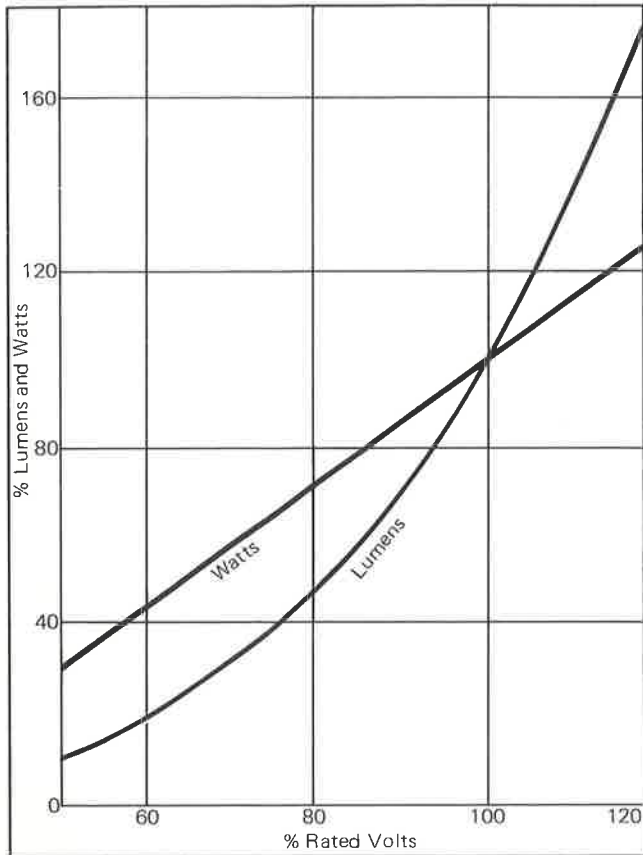


Fig. 4.
Typical life variation against operating voltage.

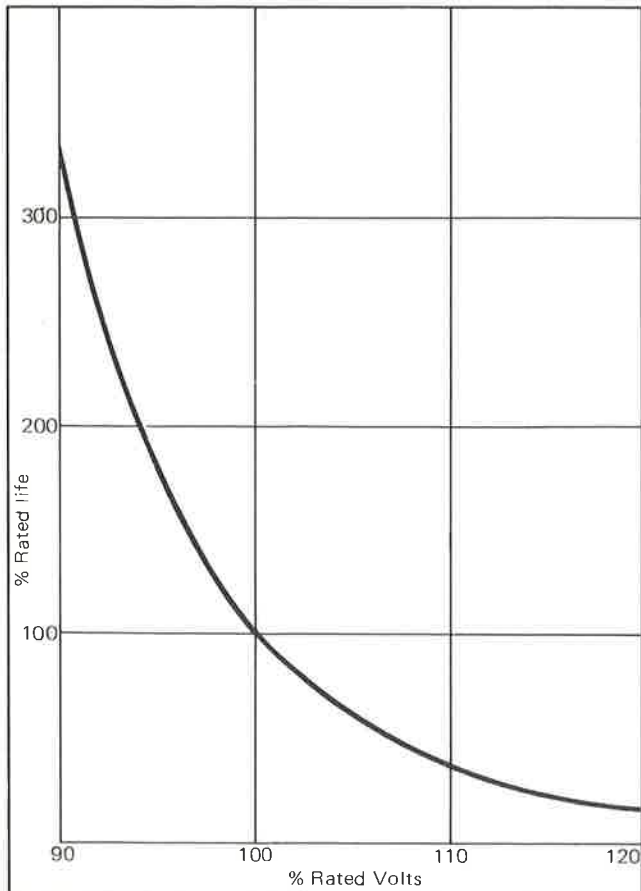


Fig. 3.
Colour temperature variation with voltage for typical studio lamp.

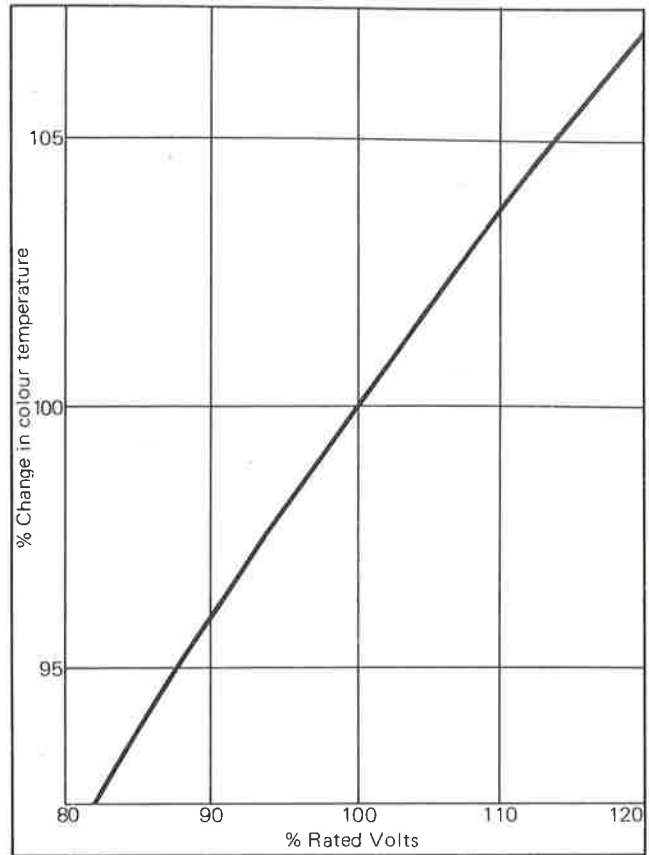


Fig. 5.
Typical power balance of studio lamps

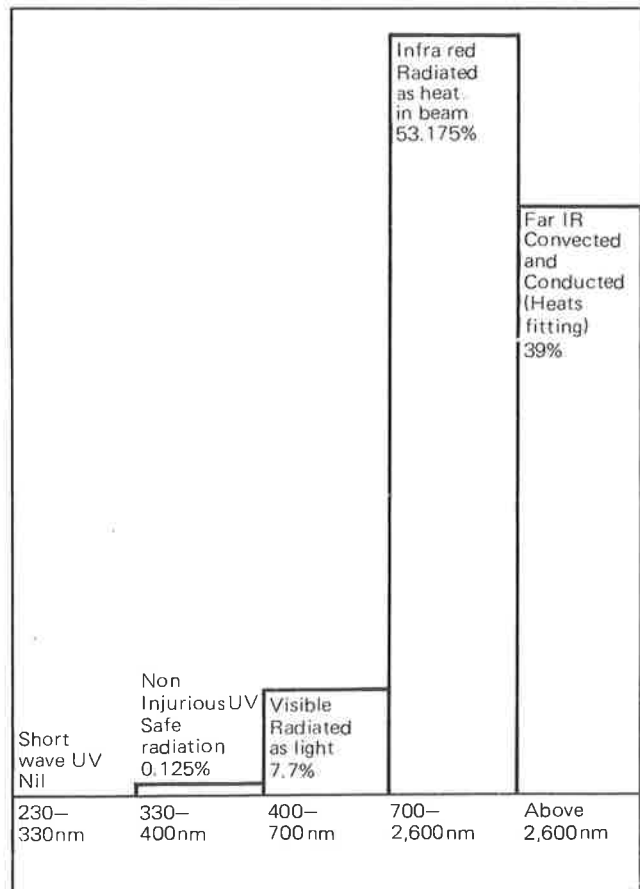
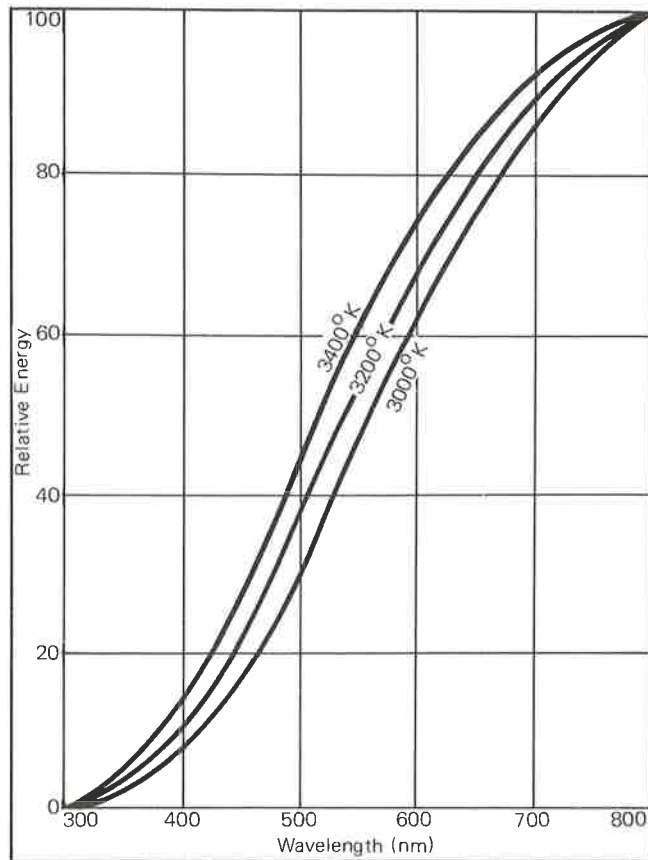
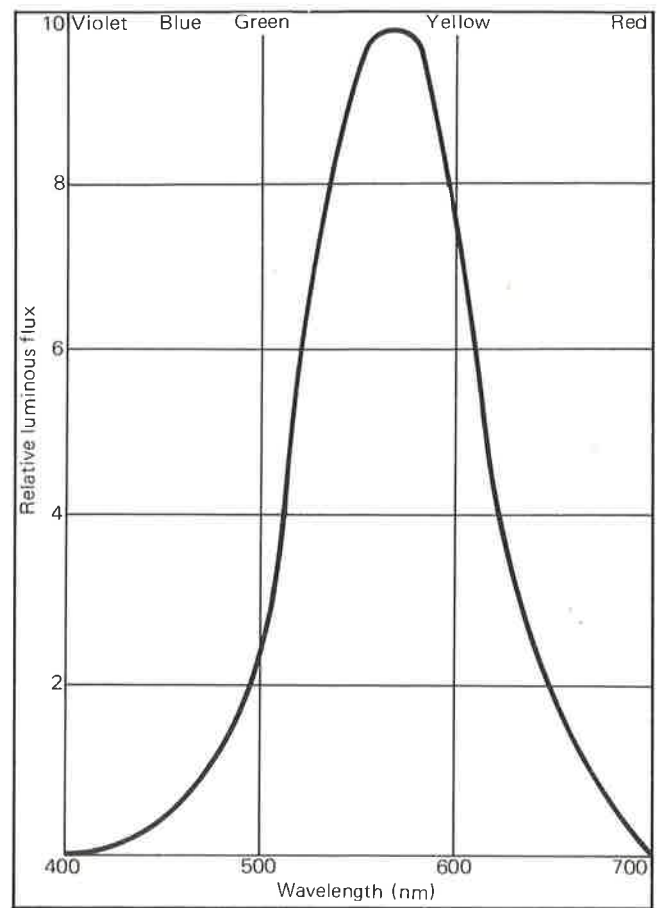


Fig. 6.
Total spectral energy distribution of typical studio lamp.



Spectral energy distribution can be shown in absolute terms (Fig. 6.) whereas radiation in terms of visible light is related to the response of the human eye (Fig. 7.).

Fig. 7.
Spectral distribution of luminous flux (Lumens) for typical theatre and studio lamp.



Operating temperatures of tungsten halogen studio lamps

The following maximum and minimum temperatures are suggested for optimum life. Operation outside these figures will not necessarily cause immediate failure but will affect life adversely to an increasing extent.

Seal – 450° C maximum

Above this figure the sealing foil oxidises at a rate increasing with temperature and is frequently the cause of short life due to seal failure.

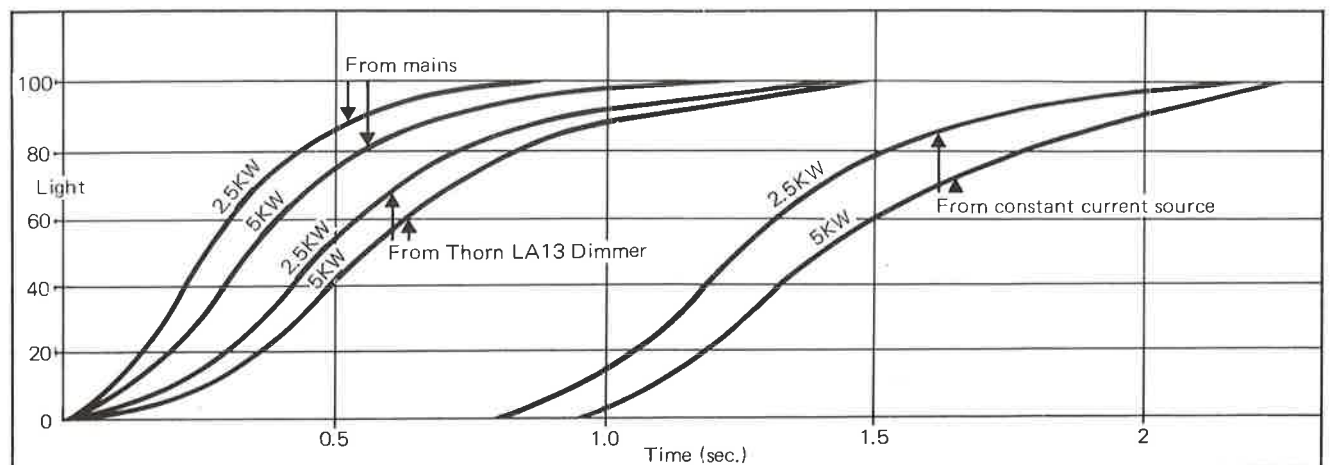
Bulb – 250–800° C

Outside this range the halogen cycle becomes less efficient and blackening may occur. Temperatures above 1200° C will cause the bulb to soften.

Pins – 300° C maximum

Above this figure the plating on the pins may lose adhesion and the contact deteriorate. Such deterioration may form local hot spots which rapidly worsen and may result in arcing and irreparable damage to both lamp and holder. Should signs of this be evident on removal of a failed lamp it is important that a good contact is restored for the next lamp fitted otherwise this will rapidly fail in similar manner.

Fig. 8.
Turn on time of studio lamps.



Surge Current

The cold resistance of a Studio lamp is approx. 1/17 of its value in normal operation. On switch on, theoretically a surge current of $17\sqrt{2}$ X the normal current would flow, and depending on the thermal mass of the filament* this will fall to the lamp normal current in approx. 1 sec. In practice this max. theoretical current does not appear due to (a) switch on does not always occur at the peak of the AC voltage, (b) the supply has some impedance which is comparable with the cold resistance of high wattage lamps, i.e. max. possible surge current = $\frac{V\sqrt{2}}{Z}$

where V is applied voltage and Z is sum of lamp cold resistance and supply impedance

Typically supply impedance is of the order of 0.3 ohm and lamp life is based on testing with such a supply. In the rare cases where line impedance is lower than this figure, an adverse effect on life may be encountered particularly with high wattage types, due to the then extremely high surge current on switching.

Lamp	Type	Cold Resistance (ohms)	Max. Surge Current (amps)				Normal Operating Current
			Line impedance =				
			0 ohms	0.1 ohms	0.3 ohms	0.5 ohms	
240V	10KW	0.34	1000	774	530	405	41.5
240V	5KW	0.7	486	424	340	283	20.8
115V	5KW	0.15	1085	650	360	250	43.5
240V	2KW	1.7	200	189	170	154	8.35
117V	2KW	0.41	404	324	233	182	17.1
240V	1KW	3.4	100	97	92	87	4.15

*It should be noted that as the rated wattage is increased and/or the rated voltage decreased, the thermal mass of the filament is increased and it takes longer to reach operating

temperature. The surge current will similarly take longer to fall to the normal operating current.

Fusing of Tungsten Halogen studio and theatre lamps

A lamp normally fails at end of life by fusing of the filament. Often an arc then forms and as there is little resistance to limit the current this rises to a very high value which if maintained can result in a serious overload on the envelope and seals. This might result in the lamp shattering.

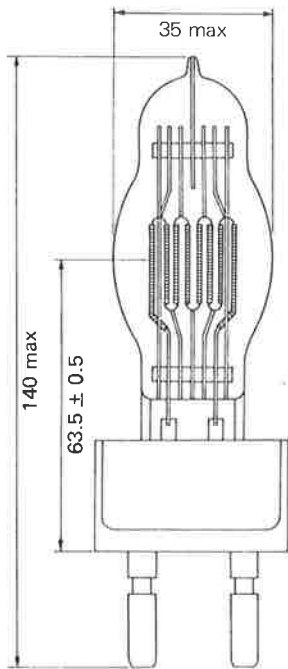
It is recommended that a HBC fuse is connected in line to interrupt any such arcs forming. Suitable types are 415–500V working High Breaking Capacity fuses to BS 88 or IEC 241, rated as below.

Lamp Power (Watts)	Fuse (rated current)		
	100–115V	115–130V	220–250V
500	6	6	4
650	10	6	4
1000	16 (15 UK)	10	6
1500	20	16 (15 UK)	10
2000	25 (30 UK)	25 (20 UK)	10
2500	35 (30 UK)	25 (30 UK)	16 (15 UK)
5000	63 (60 UK)	50	25 (30 UK)
10000	125	100	50

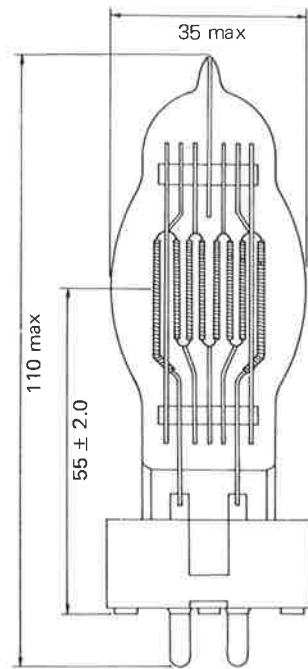
1000W C.S.I. for 220, 240V control gear 20 amp. HBC fuse

Technical Specifications/ Class CP Lamps.

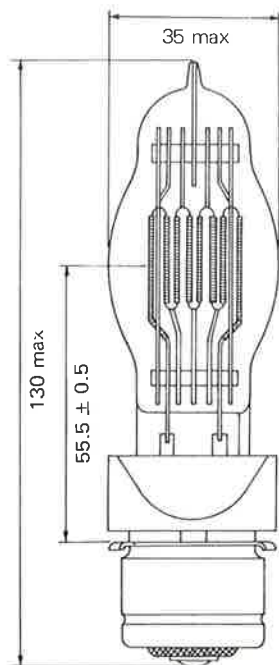
Type	CP39	
Watts	650	
Volts	115/120, 220, 240	
Base	G22 Medium bi-post	
Lumens	17,000	115/120v
	16,800	220, 240v
Average life	100 hours	
Colour Temperature	For 3200° K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	15.0mm(LV)13.5mm(HV)
	Width	13.5mm(LV)15.0mm(HV)



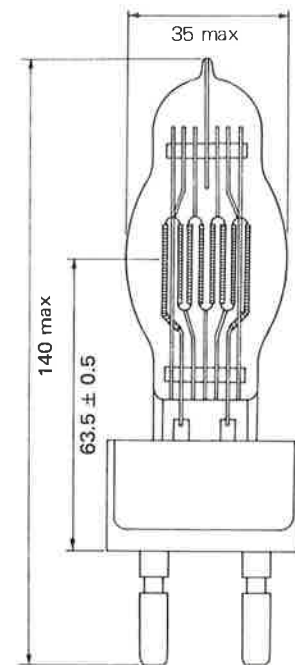
Type	CP23	
Watts	650	
Volts	115/120, 220, 240	
Base	GX9.5	
Lumens	17,000	115/120v
	16,800	220, 240v
Average life	100 hours	
Colour Temperature	For 3200° K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	15.0mm(LV)13.5mm(HV)
	Width	13.5mm(LV)15.0mm(HV)



Type	CP51	
Watts	650	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	17,000	115/120v
	16,800	220, 240v
Average life	100 hours	
Colour Temperature	For 3200° K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	15.0mm(LV)13.5mm(HV)
	Width	13.5mm(LV)15.0mm(HV)

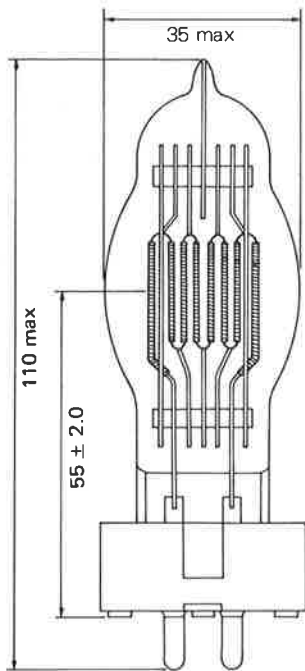


Type	CP40	
Watts	1000	
Volts	115/120, 220, 240	
Base	G22 Medium bi-post	
Lumens	27,000	115/120v
	26,000	220, 240v
Average life	200 hours	
Colour Temperature	For 3200° K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	18.5mm(LV)18.5mm(HV)
	Width	16.0mm(LV)17.5mm(HV)

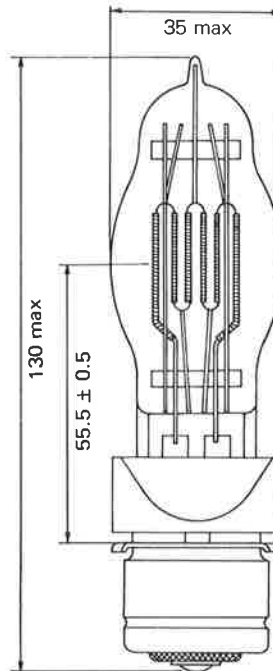


Technical Specifications/Class CP Lamps.

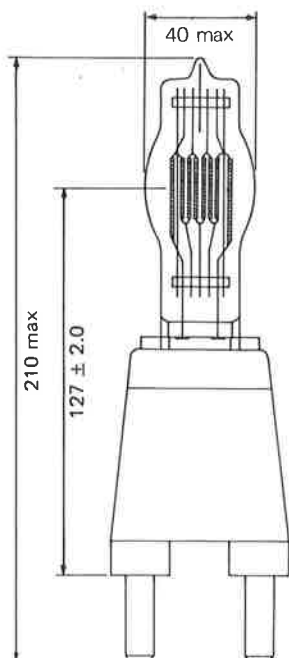
Type	CP24	
Watts	1000	
Volts	115/120, 220, 240	
Base	GX9.5	
Lumens	27,000	115/120v
	26,000	220, 240v
Average life	200 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	18.5mm(LV)18.5mm(HV)
	Width	16.0mm(LV)17.5mm(HV)



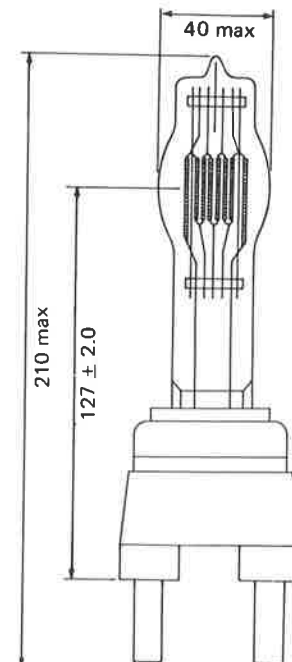
Type	CP52	
Watts	1000	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	27,000	115/120v
	26,000	220, 240v
Average life	200 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	18.5mm(LV)18.5mm(HV)
	Width	16.0mm(LV)17.5mm(HV)



Type	CP41	
Watts	2000	
Volts	115/120, 220, 240	
Base	G38 Mogul bi-post	
Lumens	54,000	115/120v
	52,000	220, 240v
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	24.0mm(LV)22.0mm(HV)
	Width	21.5mm(LV)22.5mm(HV)



Type	CP56	
Watts	2,000	
Volts	115/120, 220, 240	
Base	G38 Mogul bi-post	
Lumens	54,000	115/120v
	52,000	220, 240v
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	24.0mm(LV)22.0mm(HV)
	Width	21.5mm(LV)22.5mm(HV)

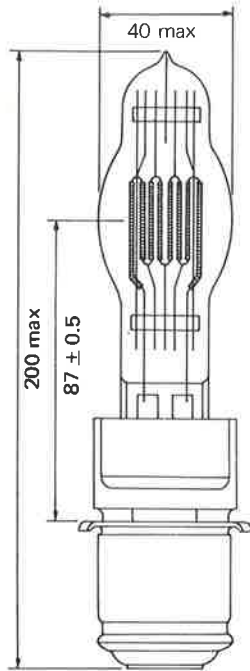


See note re-ellipsoidal spotlights inside front cover and Page 1.

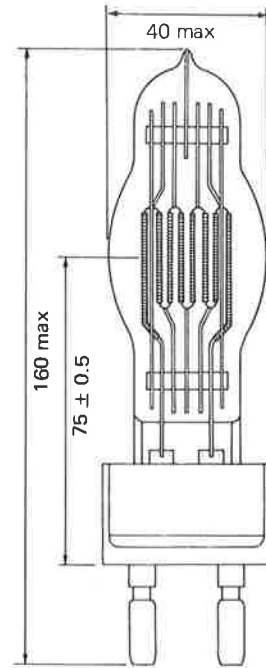
See note re-ellipsoidal spotlights inside front cover and Page 1.

Technical Specifications/Class CP Lamps.

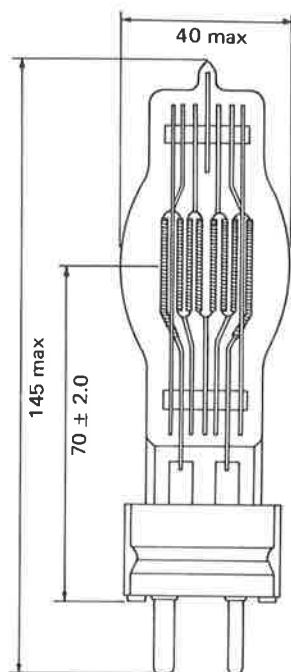
Type	CP53	
Watts	2000	
Volts	115/120, 220, 240	
Base	P40 Mogul pre-focus	
Lumens	54,000	115/120v
	52,000	220, 240v
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	24.0mm(LV) 22.0mm(HV)
	Width	21.5mm(LV) 22.5mm(HV)



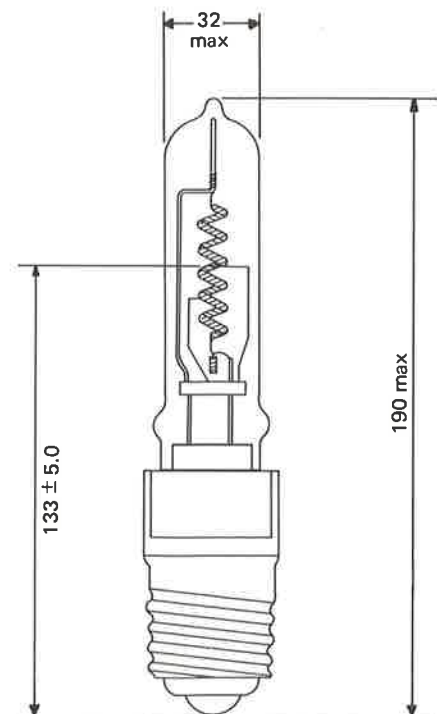
Type	CP55	
Watts	2000	
Volts	115/120, 220, 240	
Base	G22 Medium bi-post	
Lumens	54,000	115/120v
	52,000	220, 240v
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	24.0mm(LV) 22.0mm(HV)
	Width	21.5mm(LV) 22.5mm(HV)



Type	CP43	
Watts	2000	
Volts	115/120, 220, 240	
Base	GY16	
Lumens	54,000(LV)	52,000(HV)
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 90°	
Filament	Height	24.0mm(LV) 22.0mm(HV)
	Width	21.5mm(LV) 22.5mm(HV)



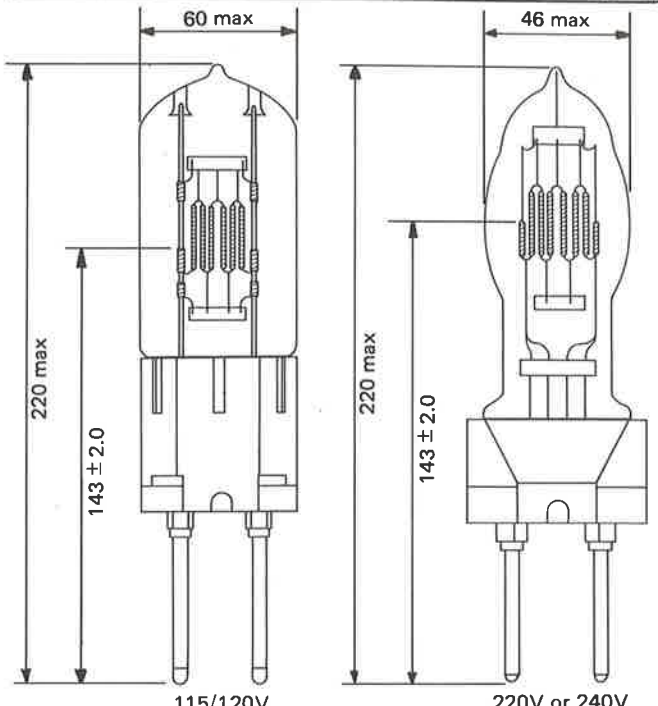
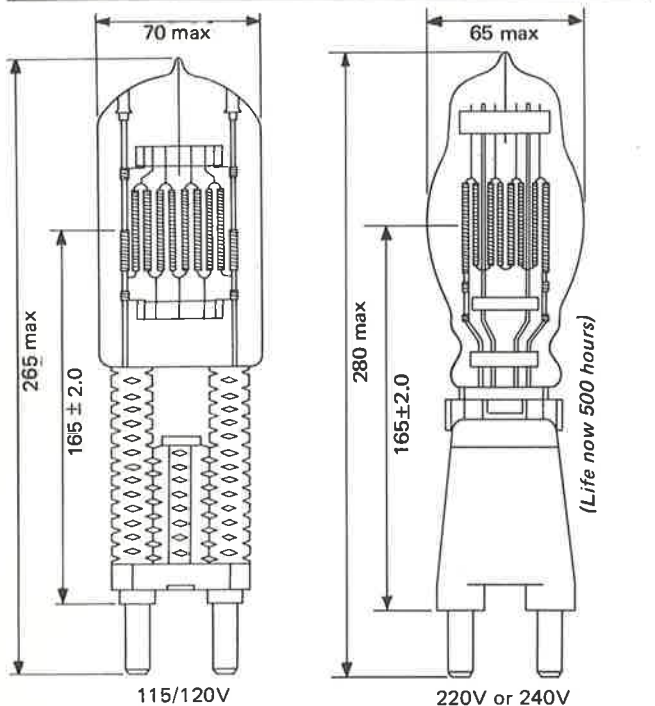
Type	CP59	
Watts	2000	
Volts	220/230, 240	
Base	E40s	
Lumens	50000	
Average life	300 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Universal	
Filament	Height	40.0mm
	Width	7.0mm



Class CP Lamps. Twin Filament Types

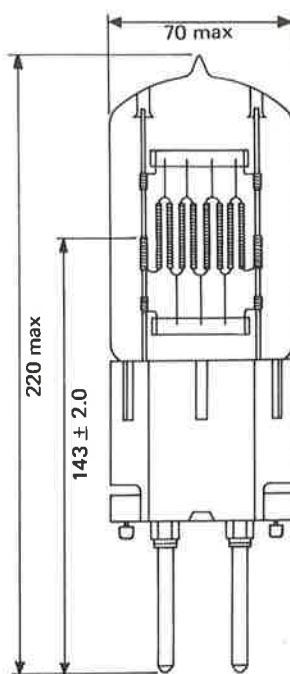
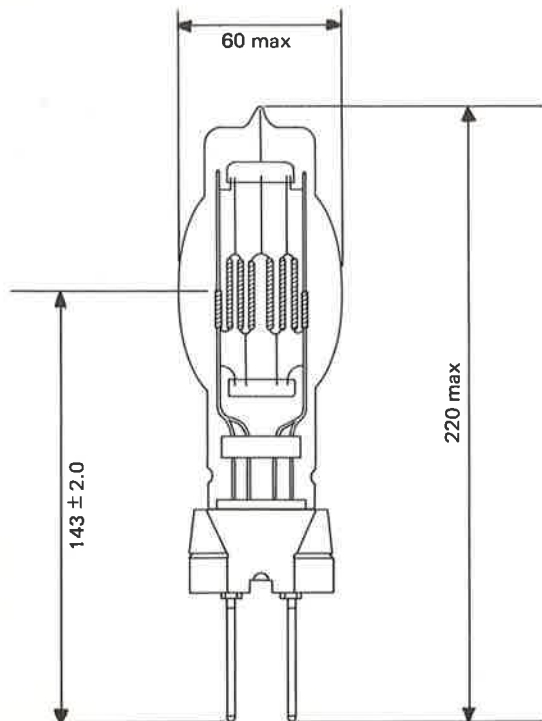
Type	CP29	
Watts	5000	
Volts	115/120, 220, 240	
Base	G38 Mogul bi-post	
Lumens	145,000	115/120v
	135,000	220, 240v
Average life	400 hours LV 500hrs (HV)	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 45°	
Filament	Height	31.0mm(LV)31.0mm(HV)
	Width	25.0mm(LV)39.0mm(HV)

Type	CP30	
Watts	1250/1250	
Volts	115/120, 220, 240	
Base	GX38q 4 pin	
Lumens	29,000/62,500	115/120v
	27,000/56,000	220, 240v
Average life	300 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 45°	
Filament	Height	17.5mm(LV)24.0mm(HV)
	Width	19.5mm(LV)18.5mm(HV)



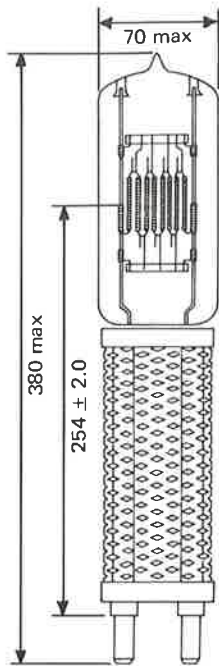
Type	CP58	
Watts	1250/2500/3750	
Volts	220, 240	
Base	GX38q 4 pin	
Lumens	27000, 56000	
Average life	300 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 45°	
Filament	Height	27.5 (2½kW) 24.0 (1¼kW)
	Width	25.0 (2½kW) 18.5 (1¼kW)

Type	CP32	
Watts	2,500/2,500	
Volts	220, 240	
Base	GX38q 4 pin	
Lumens	59,000/127,000	
Average life	300 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down ± 45°	
Filament	Height	27.5mm(HV)
	Width	29.0mm(HV)



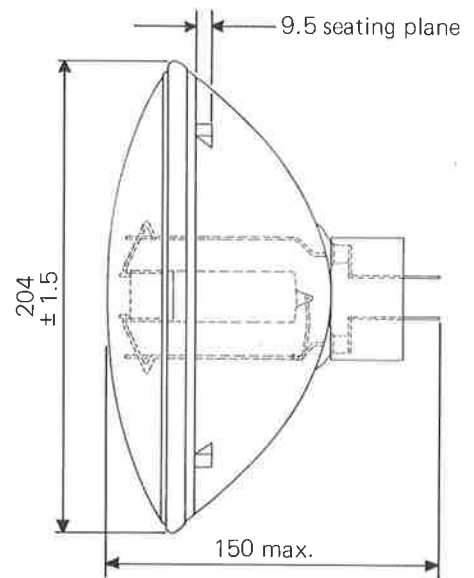
Technical Specifications/Class CP Lamps.

Type	CP54	
Watts	10,000	
Volts	220, 240	
Base	G38 Mogul bi-post	
Lumens	280,000	
Average life	400 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Vertical, Base Down $\pm 45^\circ$	
Filament (Two)	Height	31.0mm
	Width	39.0mm



Class CP lamps/PAR 64 TH

Type	CP60-CP61-CP62	
Watts	1000	
Volts	220, 240	
Base	EMEP	
Initial Beam Candlepower (Peak)		
CP60 (Narrow Spot)	320,000 CDS	
	1/2 Peak $9^\circ V \times 12^\circ H$	
	1/10 Peak $17^\circ V \times 20^\circ H$	
CP61 (Spot)	270,000 CDS	
	1/2 Peak $10^\circ V \times 14^\circ H$	
	1/10 Peak $20^\circ V \times 22^\circ H$	
CP62 (Flood)	125,000 CDS	
	1/2 Peak $11^\circ V \times 24^\circ H$	
	1/10 Peak $20^\circ V \times 38^\circ H$	
Average life	300 hours	
Colour temperature	For 3200°K Film	
Operating position	Any about a horizontal through contact lugs	



Special Order Lamps

In addition to the standard range of CP and T class lamps, a number of similar types are available to special order. In most cases, minimum quantity of 500 approx. will apply. These include non-standard voltage ranges of some of the standard types, e.g. 100V, 110/115V, 120V and the special list is given below. Other variations within the same general design would be considered for economic manufacturing quantities. Fuller details are available on application to

Thorn Lighting Limited
Photographic Division
Thorn House
Upper Saint Martin's Lane
London WC2H 9ED
Telephone 01-836 2444
Telex 24184/5 TEILdn G

Thorn Reference	Replacement for ANSI Reference	Voltage Ranges Available	Watts	Colour Temperature	Cap	LCL		Life (hrs)	Outline	
						(mm)	Lumens		Similar To	Special Features
HX14	IM/T20P/SP†	120	1000	3050	P28	55.5	24500	750	T14	C
HX15	IM/T12/2†	120	1000	3050	P28	88.9	24500	750	T15	A
HX16		120	1000	3050	P40	87	24500	750	T16	C
HX21	BTN	120	750	3000	P28	55.5	17000	750	T14	C
HX22	EGR	120	750	3200	G22	63.5	20500	200	CP40	C
HX25		110/115, 115/120, 220, 240	2500	3200	G38	165	67000/65000	400	CP41*	B, F
HX26		120, 220, 240	2000	3200	E40	127	58000/54000	400	CP53	C, F, G
HX27		220/230, 240	2000	3200	GY16	85	52000	300	CP59	G, (AH)or(C)
HX31	CXZ	120	1500	3200	G38	127	41000	300	CP41	C
HX33	(64788)**	220	2000	3200	GY16	70	52000	250	CP43	C, E
HX34	DRB†	120	1000	3350	P28	55.5	32000	50	CP52	C
HX35	750/T12/9†	120	750	3000	P28	88.9	17000	750	T15	D
HX37	(51233)**	220, 240	650	3200	G22	102	16800	100	CP39*	D, H
HX38	BTP	120	750	3200	P28	55.5	20500	200	CP52	C
HX40	EGT	120	1000	3200	G22	63.5	28000	250	CP40	C
HX41	CYX	120	2000	3200	G38	127	58000	400	CP41	C
HX42	EGN	120	500	3200	G22	63.5	13000	100	CP39	C
HX44	BVW	120	2000	3200	P40	100	58000	400	CP53*	C
HX45	CWZ	120	1500	3200	P40	100	41000	300	CP53*	C
HX46	BVV	120	1000	3200	P40	100	28000	250	T16*	C
HX47	BTM	120	500	3200	P28	55.5	13000	100	T17	C
HX48		220, 240	3000	3200	G38	127	82000	400	CP56	C
HX49	(56.6583)**	220, 240	1000	3200	E40	120	26000	200	T16*	C
HX50	(56.6783)**	115/120, 220, 240	2000	3200	E40	133	56000/54000	400	CP53*	C, F, G
HX53		120	2000	3200	P40	87	58000	400	CP53	C
HX56	CYX	120	2000	3200	G38	127	58000	400	CP56	C, J
HX57		115/120, 220, 240	2500	3200	G38	127	67000/65000	400	CP56	B, F, G
HX80	GE500T12/8†	120	500	2950	P28	88.9	10500	750	T15	D
HX81		220, 240	1000	3050	GX9.5	75	23000	750	T11*	C, J
HX82		115/120, 220, 240	500	2950	GX9.5	55	9500	750	T17	C, G

All types listed above have quartz envelopes and operate on halogen principle.

* Dimensions modified

** German Osram Code

† ANSI (or other US) code listed is glass version with shorter life than quartz halogen version

A Operating position universal

B Operating position $V \pm 45$

C Operating position $V \pm 90$

D Operating position Base up ± 45

E Biplane coil

F Higher lumen figure applicable to low voltage ranges

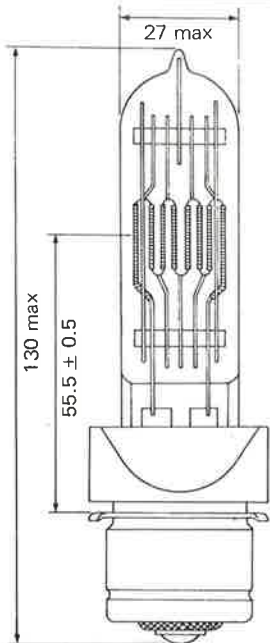
G Alternative cap to outline given

H Special operating conditions. Apply for details if interested

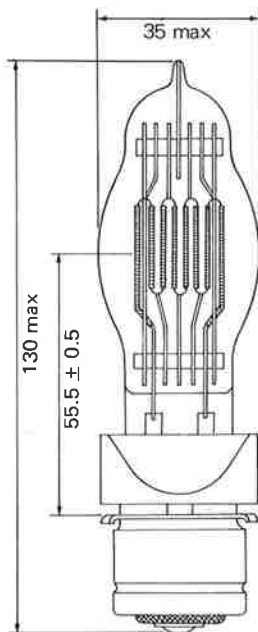
J Special design for ellipsoidal reflector luminaires

Class T Lamps

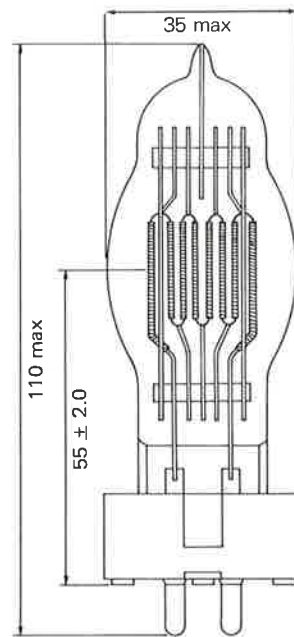
Type	T17	
Watts	500	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	10,500	115/120v
	9,500	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament	Height	13.0mm
(Low Volt)	Width	15.0mm
Filament	Height	15.0mm
(High Volt)	Width	13.5mm



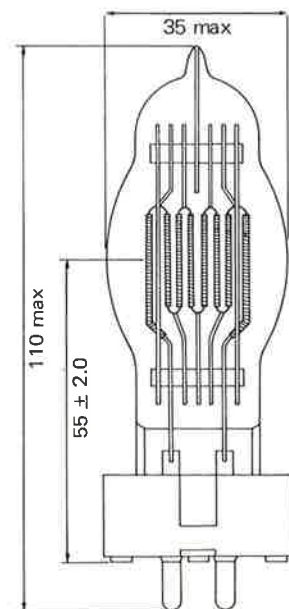
Type	T13	
Watts	650	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	13,500	115/120v
	13,500	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament	Height	15.0 mm
(Low Volt)	Width	16.0mm
Filament	Height	15.4mm
(High Volt)	Width	15.0mm



Type	T12	
Watts	650	
Volts	115/120, 220, 240	
Base	GX9.5	
Lumens	13,500	115/120v
	13,500	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament	Height	15.0 mm
(Low Volt)	Width	16.0mm
Filament	Height	15.4mm
(High Volt)	Width	15.0mm

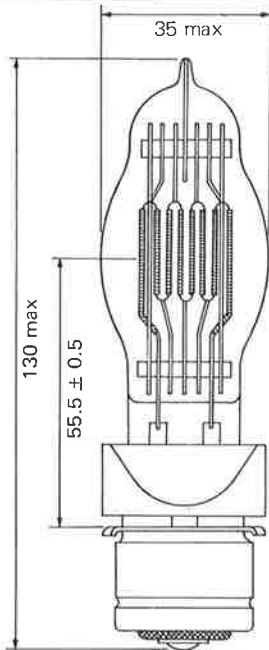


Type	T11	
Watts	1000	
Volts	115/120, 220, 240	
Base	GX9.5	
Lumens	23,000	115/120v
	23,000	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament	Height	19.0mm
(Low Volt)	Width	16.0mm
Filament	Height	18.0 mm
(High Volt)	Width	17.5mm

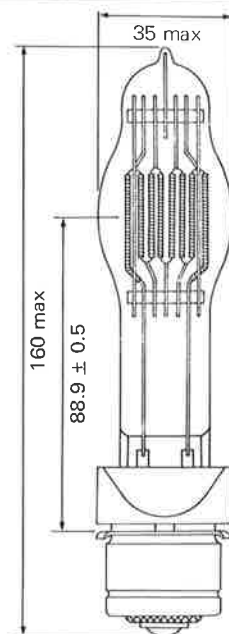


Technical Specifications/Class T Lamps

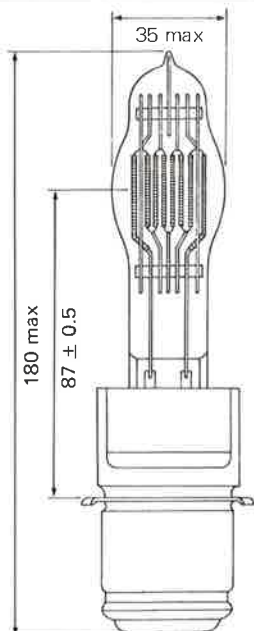
Type	T14	
Watts	1000	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	23,000	115/120v
	23,000	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament (Low Volt)	Height	19.0mm
	Width	16.0mm
Filament (High Volt)	Height	18.0 mm
	Width	17.5 mm



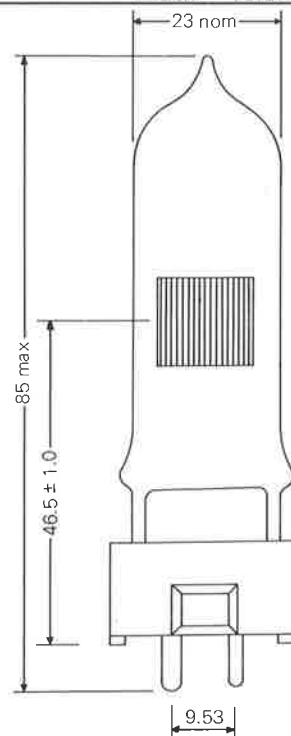
Type	T15	
Watts	1000	
Volts	115/120, 220, 240	
Base	P28 Medium pre-focus	
Lumens	23,000	115/120v
	23,000	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Any	
Filament (Low Volt)	Height	19.0mm
	Width	16.0mm
Filament (High Volt)	Height	18.0 mm
	Width	17.5 mm



Type	T16	
Watts	1000	
Volts	115/120, 220, 240	
Base	P40 Mogul pre-focus	
Lumens	23,000	115/120v
	23,000	220, 240v
Average life	750 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical, Base Down $\pm 90^\circ$	
Filament (Low Volt)	Height	19.0mm
	Width	16.0mm
Filament (High Volt)	Height	18.0 mm
	Width	17.5 mm

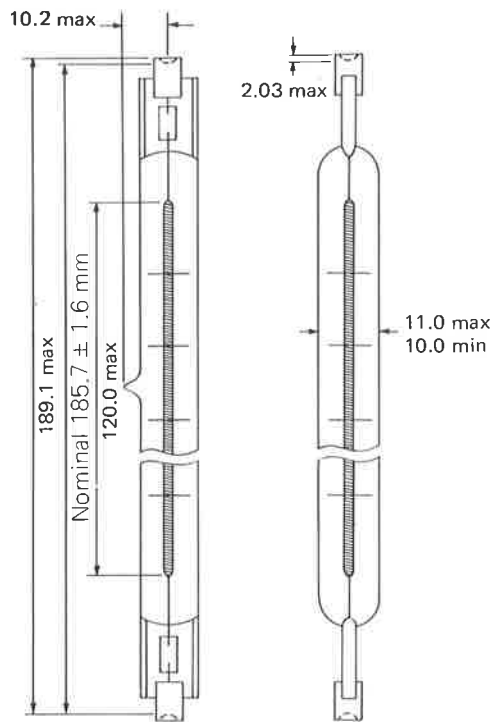


Type	T (HX83)	
Watts	500	
Volts	220, 240	
Base	GY9.5	
Lumens	11,000	
Average life	300 hours	
Colour Temperature	Theatre Spotlight	
Operating Position	Vertical Base Down $\pm 90^\circ$	
Filament	Height	12.0mm
	Width	13.0mm

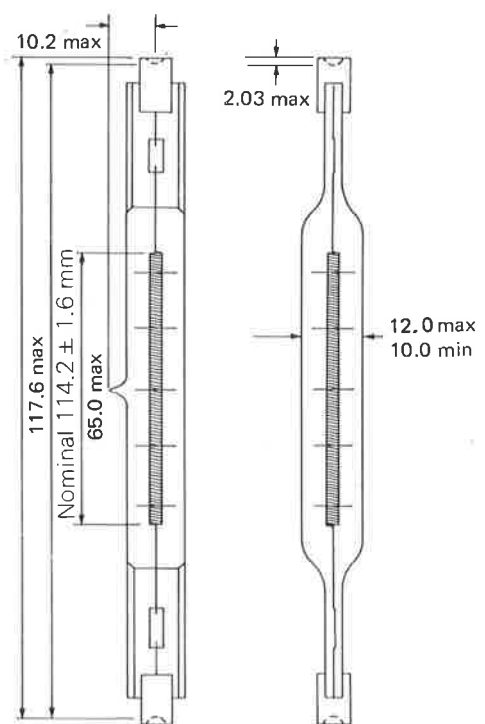


Class P2 Lamps

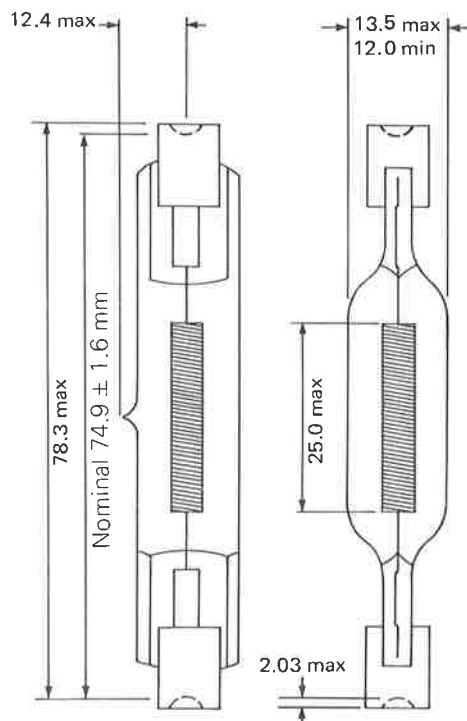
Type	P2/10
Watts	625
Volts	220/230, 240/250
Cap	R7S
Lumens	15,500
Average life	200 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal $\pm 4^\circ$
Filament	Length 120.0mm



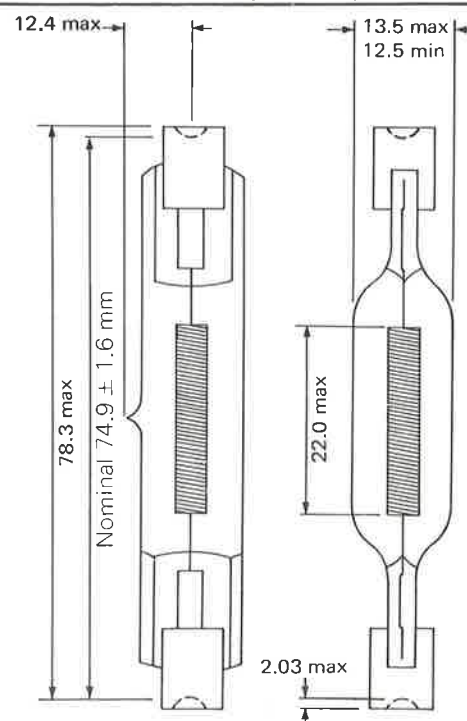
Type	P2/15
Watts	625
Volts	220/230, 240/250
Cap	R7S
Lumens	16,250
Average life	75 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal $\pm 4^\circ$
Filament	Length 65.0mm



Type	P2/6
Watts	650
Volts	115/120
Cap	R7S
Lumens	17,000
Average life	100 hours
Colour Temperature	For 3200° K Film
Operating Position	Universal
Filament	Length 25.0mm

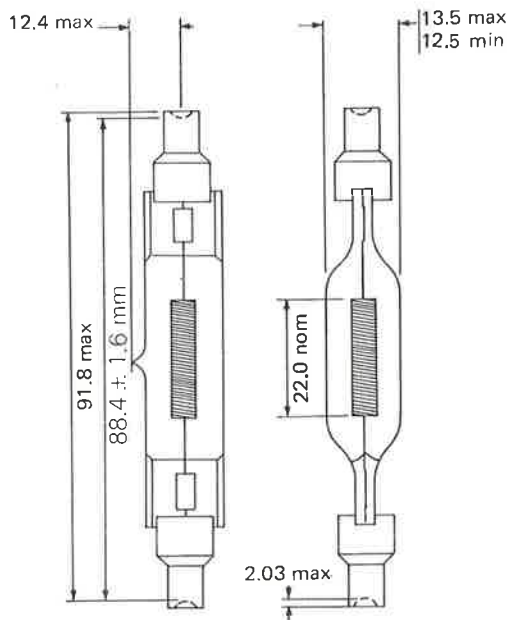


Type	P2/13
Watts	800
Volts	220/230, 240/250
Cap	R7S
Lumens	20,000
Average life	75 hours
Colour Temperature	For 3200° K Film
Operating Position	Universal
Filament	Length 22.0mm Width 4.0mm

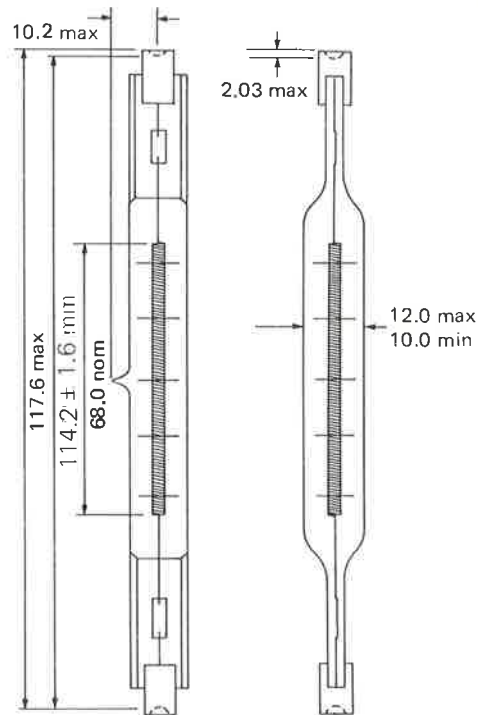


Technical Specifications/Class P2 Lamps

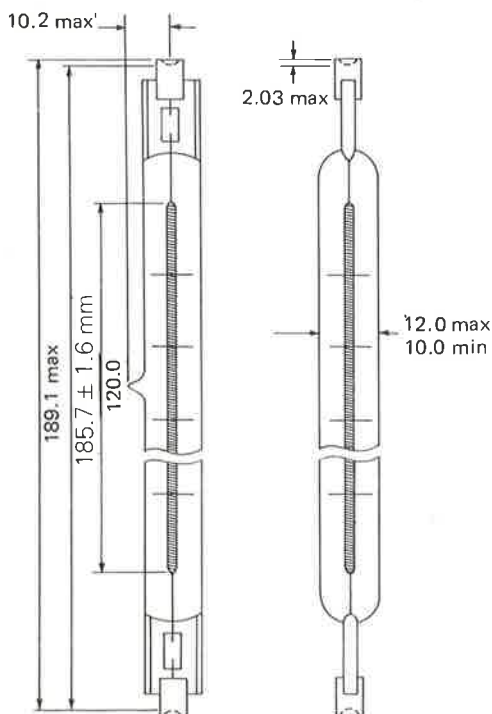
Type	P2/14	
Watts	800	
Volts	220/230, 240/250	
Cap	R7S Special	
Lumens	20,000	
Average life	75 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Universal	
Filament	Length	22.0mm
	Width	4.0mm



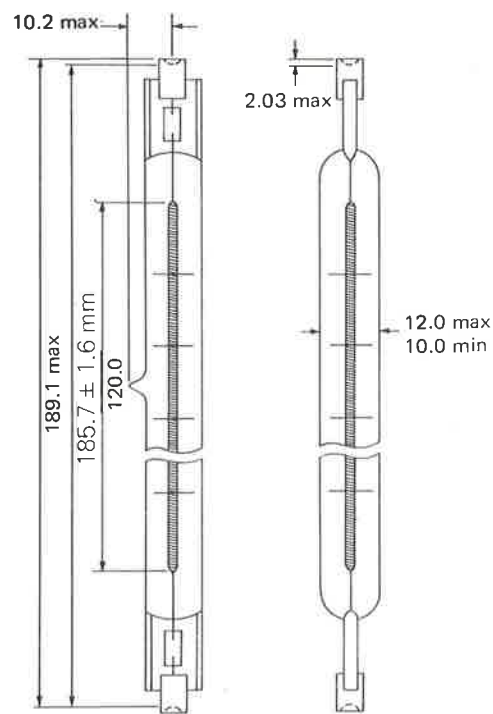
Type	P2/11	
Watts	800	
Volts	220/230, 240/250	
Cap	R7S	
Lumens	21,600	
Average life	150 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Horizontal ± 4°	
Filament	Length	68.0mm



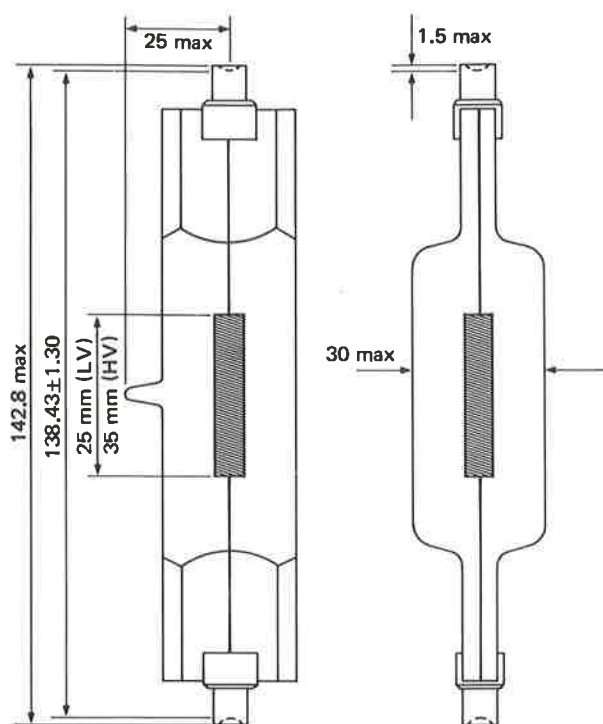
Type	P2/7	
Watts	1000	
Volts	220/230, 240/250	
Cap	R7S	
Lumens	26,000	
Average life	200 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Horizontal ± 4°	
Filament	Length	120.0mm



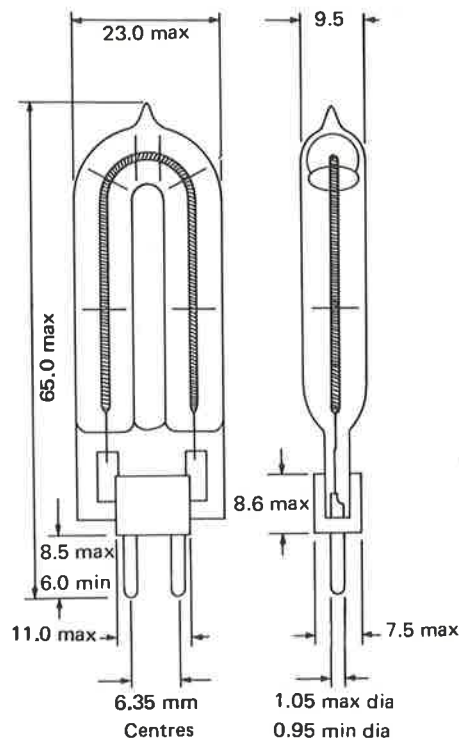
Type	P2/12	
Watts	1250	
Volts	220/230, 240/250	
Cap	R7S	
Lumens	33,500	
Average life	200 hours	
Colour Temperature	For 3200°K Film	
Operating Position	Horizontal ± 4°	
Filament	Length	120.0mm



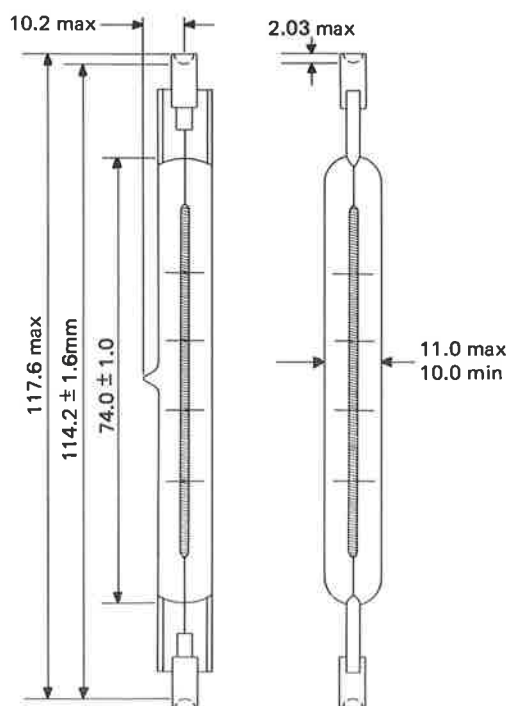
Type	P2/27
Watts	2,000
Volts	120, 220/230, 240
Cap	RX7S
Lumens	56,600 (LV) 50,000 (HV)
Average life	500hrs(LV)300hrs(HV)
Colour Temperature	For 3200° Film
Operating Position	Universal
Filament	Length 25 mm(LV)35 mm nom(HV)



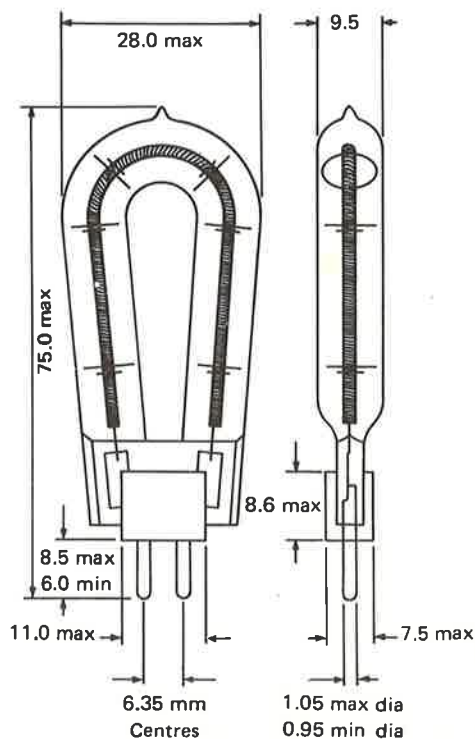
Type	P2/16
Watts	650
Volts	220/230, 240/250
Cap	2 pin ceramic G6.35
Lumens	17,500
Average life	50 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal to Base Down



Type	P2/28 Clear P2/29 Frosted
Watts	1000
Volts	120
Cap	R7s
Lumens	27 000
Average Life	300 hours
Colour Temperature	For 3200° Film
Operating Position	Horizontal ± 4°
Filament	Length 74.0mm ± 1.0mm

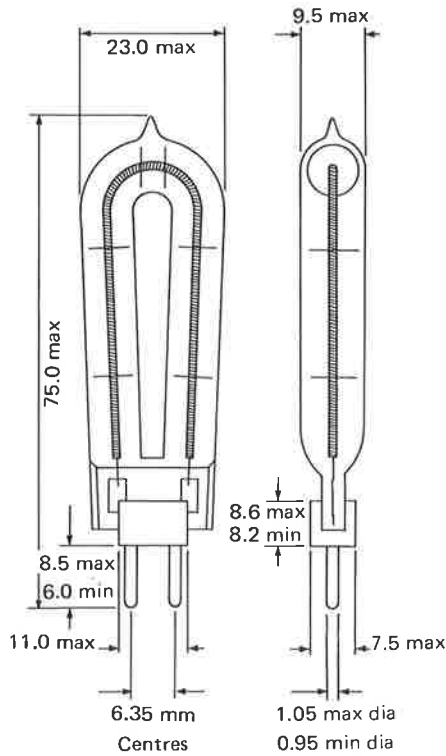


Type	P2/25
Watts	850
Volts	115/120
Cap	2 pin ceramic G6.35
Lumens	23,000
Average life	50 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal to Base Down

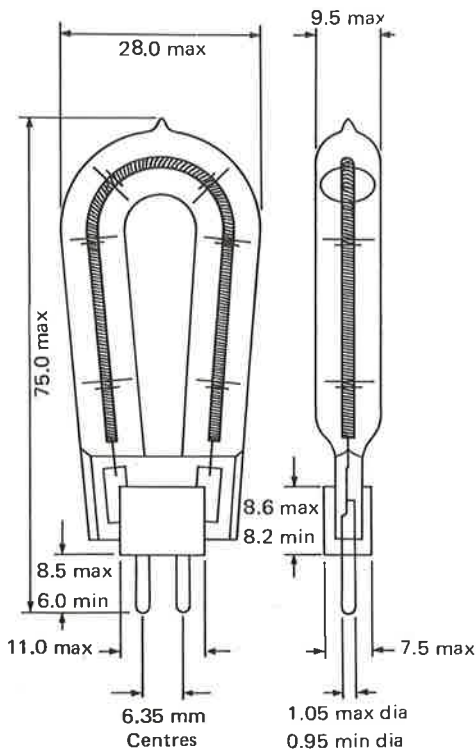


Technical Specifications/Class P2 Lamps

Type	P2/17
Watts	1000
Volts	220/230, 240/250
Cap	2 pin ceramic G6.35
Lumens	28,000
Average life	50 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal to Base Down

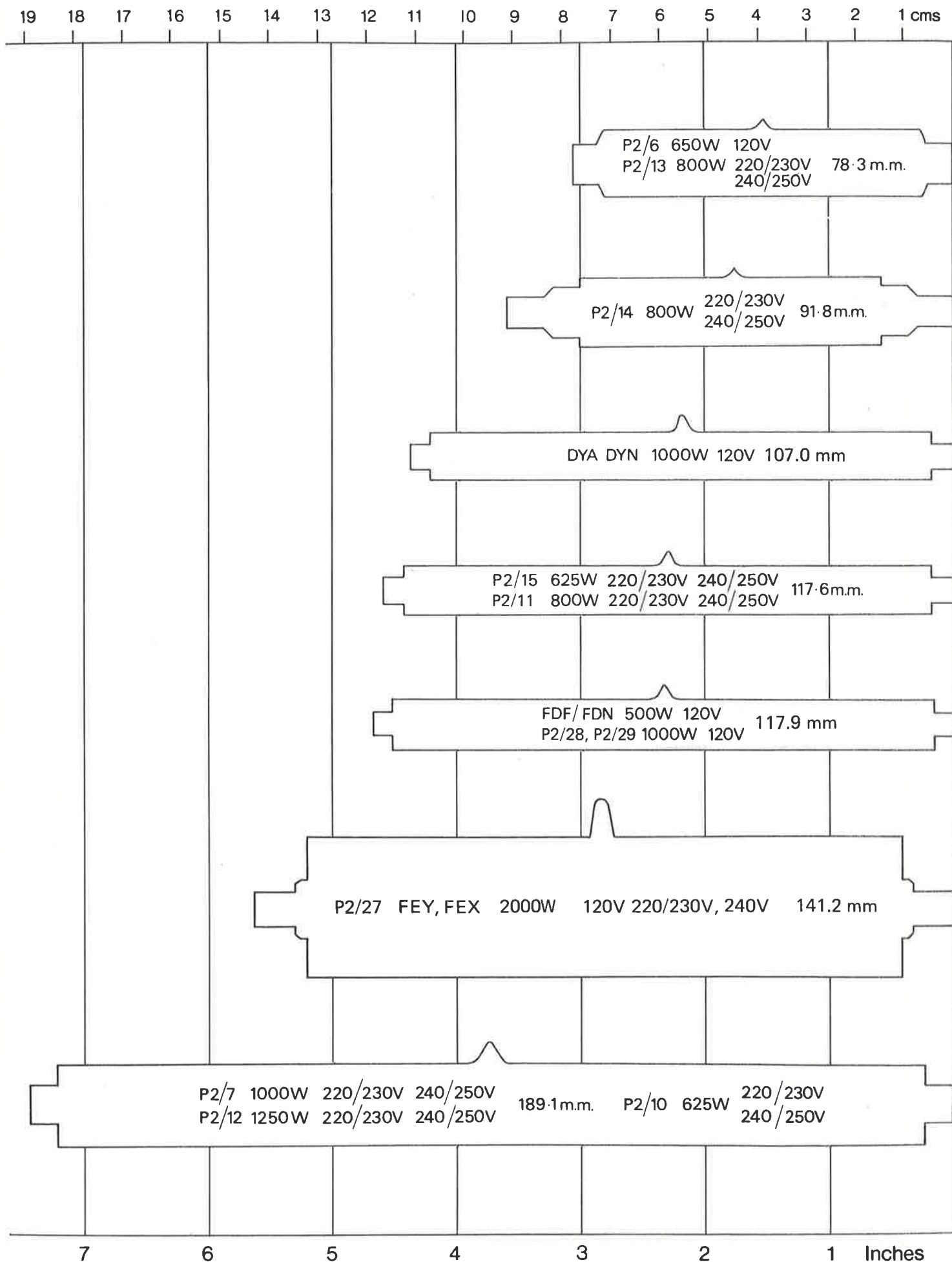


Type	P2/26
Watts	1250
Volts	220/230, 240/250
Cap	2 pin ceramic G6.35
Lumens	35,000
Average life	50 hours
Colour Temperature	For 3200° K Film
Operating Position	Horizontal to Base Down



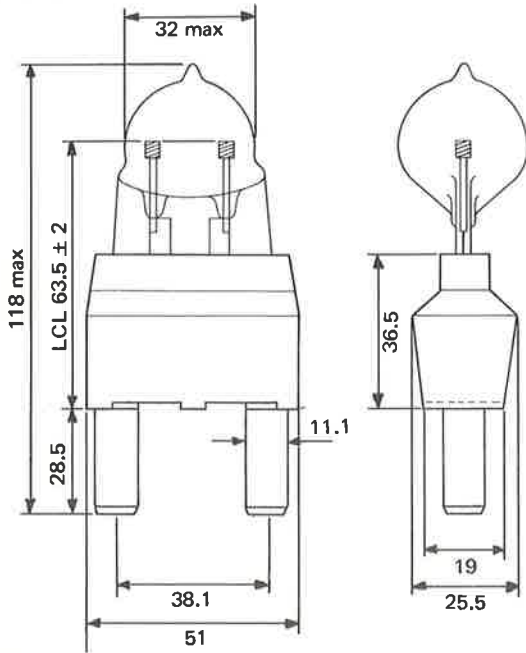
Class P2 Linear Lamps 3200°K

NB. Dimensions indicated on this chart are maximum clearance lengths.

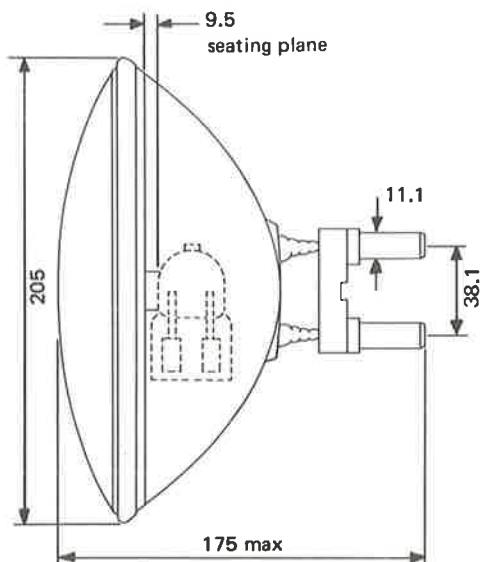


Compact Source Iodide Lamps/ Hot Restrike

Type	99-0421
Watts	1000
Supply Volts	220, 240
Arc Volts	70/85
Cap	G38
Initial Lumens	90,000
Lumen Maintenance	90%
Average life	200 hours
Chromaticity Co-ordinates X =	0.395
Y =	0.395
CV =	3.5%
Operating Position	Universal
Arc Length	14–15mm

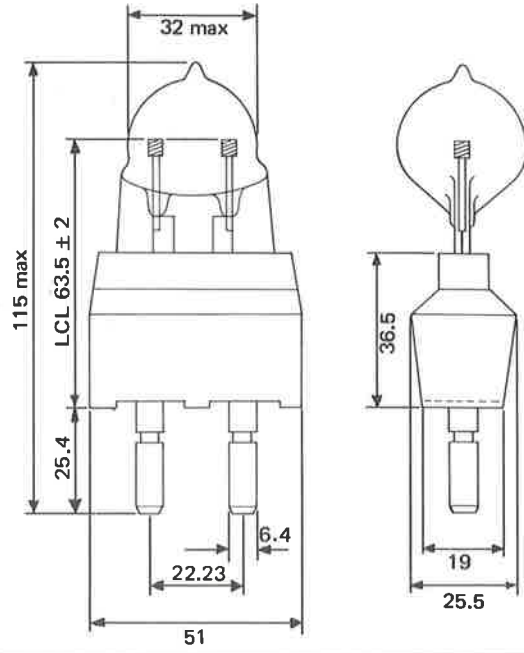


Type	99-1422 and 99-1222
Watts	1000
Supply Volts	220, 240
Arc Volts	70/85
Cap	G38
Initial Beam Candlepower (Peak)	1.5 million CDS
1/2 Peak ±	3°
1/5 Peak ±	6°
1/10 Peak ±	9°
Lumen Maintenance	90%
Average life	1000 hrs
Chromaticity Co-ordinates X =	0.395
Y =	0.395
CV =	3.5%
Operating Position	Universal

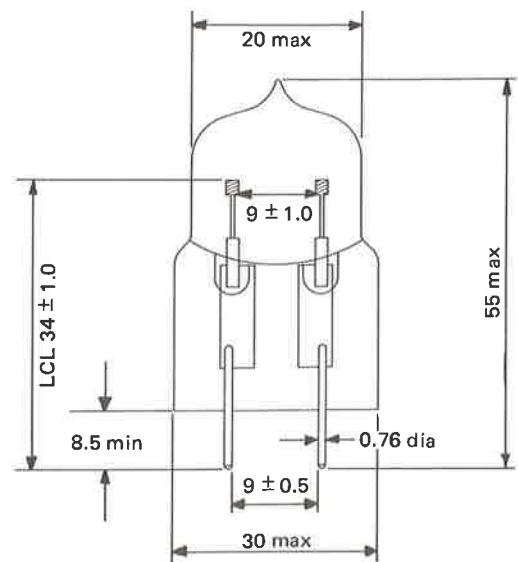


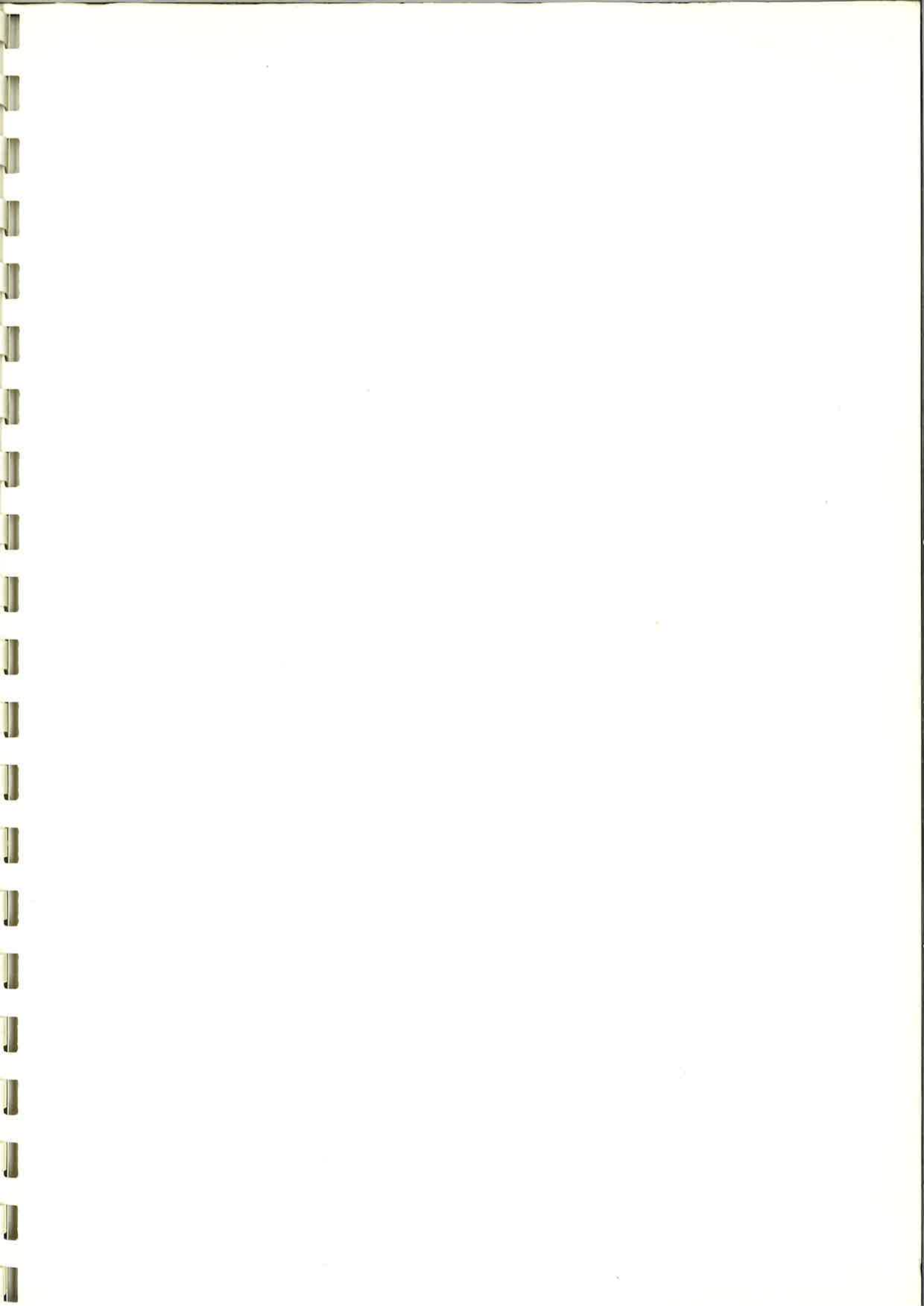
Standard Lamp

Type	99-0221
Watts	1000
Supply Volts	220, 240
Arc Volts	70/85
Cap	G22
Initial Lumens	90,000
Lumen Maintenance	90%
Average life	200 hours
Chromaticity Co-ordinates X =	0.395
Y =	0.395
CV =	3.5%
Operating Position	Universal
Arc Length	14–15mm



Type	99 – 0201
Watts	400
Supply Volts	220, 240
Arc Volts	100 nom
Cap	2 pin, 9.0mm ± 0.5 spacing
Initial Lumens	32 000
Lumen Maintenance	90%
Average life	500 hrs
Chromaticity Co-ordinates X =	0.395
Y =	0.395
CV =	3.5%
Operating Position	Universal





For more detailed information on Thorn Studio Lamps please consult your nearest Thorn Lighting office.

Thorn Lighting Limited UK Branches

Photographic Division

Thorn House, Upper Saint Martin's Lane
London WC2H 9ED
Telephone 01-836 2444
Telex 24184/5 TEILDn G

Belfast

Prince Regent Road, Castereagh
Belfast BT5 6QR
Telephone 0232-54122
Telex 74695 TLLBFT G

Birmingham

Thorn House, Aston Church Road
Saltley Trading Estate, Birmingham B81 BE
Telephone 021-327 1535
Telex 337435 TLLBHM G

Cardiff

Thorn House, Penarth Road
Cardiff, Wales CF1 7YP
Telephone 0222-44200
Telex 49334 TLLCDF G

Glasgow

Thorn House, Lawmoor Street
Glasgow G5 0TT
Telephone 041-429 6222
Telex 77630 TLLGLW G

Leeds

Thorn House, 3 Ring Road
Lower Wortley, Leeds LS12 6EJ
Telephone 0532-636321
Telex 55110 TLLLDS G

London

Victoria Trading Estate, Victoria Way
Charlton, London SE7 7PA
Telephone 01-858 3201 (order office) or
01-858 3281 (all other enquiries)
Telex 896171 TLLCHN G

Manchester

Thorn House, 2 Claytonbrook Road
Clayton, Manchester M11 1BP
Telephone 061-223 1322
Telex 668642 TLLMCR G

Reading

10 Richfield Avenue, Reading RG1 8PA
Telephone 0734-53257
Telex 849269 TLLRDG G

Southampton

West Quay Trading Estate, West Quay Road
Southampton SO9 1FF
Telephone 0703-27401
Telex 477728 TLLSTN G

Government Contracts & Order Office

Progress House, Great Cambridge Road
Enfield EN1 1UL
Telephone 01-363 5353
Telex 263201 TEIENF G

Thorn Lighting Limited Overseas Companies

Australia

Thorn Lighting Industries Pty Limited
210 Silverwater Road, Lidcombe
New South Wales 2141
Telephone 648-8000
Telex 22350 Thornlit Sydney

Austria

Thorn Electrical Industries GmbH
Erzerzog-Karl-Strasse 57, A-1220 Wien
Telephone Vienna (0222) 23 35 71
Telex 76128 Thorn WA

Belgium

SA Thorn Benelux NV
Rue Général Tombeur Straat 14, 1040 Brussels
Telephone 02/734 07 77 - 734 39 58
Telex 62410 Thorn B

Canada

Thorn Lighting Canada Limited
7621 Bath Road, Mississauga, Ontario L4T 3T1
Telephone (416) 677-4248
Telex 06-968569 Thorn Tor

Denmark

Thorn Lampe A/S
Fabriksparken 4, DK-2600 Glostrup
Telephone (02) 45 25 33
Telex 33533 Thorn DK

France

Thorn Electrique SA
26 Rue de la Baisse, 69625 Villeurbanne
Telephone (78) 84 04 90
Telex 380.900 Thornlec VILRB

Germany

Thorn Licht Beleuchtungsges mbH
Borsteler Chaussee 287, D-2000 Hamburg 61
Postfach 610560
Telephone 040 58 01 31
Telex 214743 Thor D

Ireland

Thorn Lighting Limited
320 Harolds Cross Road, Dublin 6
Telephone 961877
Telex 4596 Torn EI

Italy

Societa Industriale Vicentina Illuminazione SpA
Casella Postale 604, 36100 Vicenza
Telephone (444) 55 41 00
Telex 48049 Sivitaly

Societa Italiana Distribuzione

Articoli Illuminazione SpA
Via 55, Venezia 35100, Padua
Telephone 49 661633/661609
Telex 43359 SIDAI PD

New Zealand

Thorn Electrical Industries (NZ) Limited
PO Box 15150, 13a Veronica Street, New Lynn
Auckland 7
Telephone 871. 169
Telex NZ 2648

Norway

Norske Thorn A/S
Pilestredet 75c, Postboks 7065, Oslo 6
Telephone (02) 46 98 40
Telex 16928 Atlas N

South Africa

Thorn Lighting (SA) (Pty) Limited
PO Box 43075
corner Watt and Edison Streets
Industria 2042, Transvaal
Telephone 839 2434
Telex J 0149

Sweden

Thorn Belysning AB
Anderstorpvägen 4, Fack, 17104 Solna
Telephone (08) 83 41 00
Telex 10106 Thornab S

USA

Thorn Lighting (US) Inc
Thorn House
23 Leslie Court, Whippany, New Jersey 07981
Telephone 201 386 9525
Telex 710 986-8249 Thorn USA WIPY

Thorn Lighting Limited Photographic Division

Head Office

Thorn House, Upper Saint Martin's Lane
London WC2H 9ED
Telephone 01-836 2444
Telex 24184 TEILDn G
Cables Eleclampo WC2

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