S P E C I F I E R
G U I D E

L A M P S

OSRAM

In the sphere of technological advance, OSRAM have always been at the forefront.

The company were the inventors of the high pressure mercury lamp, and the first to install it.

The very first fluorescent lamp was also an OSRAM invention, and the LUMILUX range of triphosphor tubes now offers high technology performance.

These LUMILUX triphosphors also led to the development of the OPUS range of compact fluorescent lamps, which provide the operational advantages of fluorescent tubes in compact size.

OSRAM also introduced the SON lamp to Europe and followed this with the ultimate refinement and development, SON Plus, which offers up to 20% more light output than conventional SON lamps.

Recent developments include further expansion of the POWER STAR range of HQI lamps including the HQI-T – the world's smallest metal halide lamp.

HALO STARS are the largest available range of low-voltage tungsten halogen lamps, including dichroic and aluminium reflectors and capsule versions.

Every OSRAM lamp is a quality product, backed by the resources of a worldwide manufacturer and a commitment to technology.

CONTENTS

L·A·M·P S·E·

Recent achievements in lamp technology provide the designer and specifier with an ever increasing range of light sources. The principal criteria when planning any lighting project are EFFICIENCY, COLOUR PERFORMANCE, INSTALLATION, SIZE/SHAPE and OPERATING LIFE.

EFFICIENCY is the easiest to evaluate as it is the most simple to measure. The applied measurement is in lumens per watt (lm/W) and is referred to as 'efficacy'. This can range from 12 lm/W for a conventional GLS tungsten filament lamp up to 180 lm/W for some low pressure sodium (SOX) discharge lamps.

The efficacy of a light source is related to its colour performance due to the spectral response of the human eye. A SOX lamp has a high efficacy because it generates a single wavelength of light, close to 555 nanometres, at which the eye is most sensitive.

COLOUR PERFORMANCE

This has two distinct aspects: colour rendering and colour appearance.

Colour rendering defines the colour that objects will appear under a particular light source and is determined by the relative levels of radiation across the visible spectrum

COLOUR APPEARANCE AND COLOUR RENDERING PROPERTIES

COLOUR RENDERING		LAMP TYPE	COLOUR APPEARANCE		
			More than 5000 K	3300-5000 K	Less than 3300 K
Group 1	1a Ra 90-100	Fluorescent-triphosphor	12 LUMILUX DE LUXE Daylight	22 LUMILUX DE LUXE Cool White	32 LUMILUX DE LUXE Warm White
		Fluorescent-standard	Colour matching		
		Tungsten halogen			HALO STAR
		GLS			GLS
		Metal halide	POWER STAR HQI/D		
	1b Ra 80-89	Fluorescent-triphosphor	11 LUMILUX Daylight	21 LUMILUX Cool White	31, 41, LUMILUX Warm White, Warm
		Fluorescent-standard		Natural	
		Metal halide		POWER STAR HQI/NDL	POWER STAR HQI/WDL
Group 2	2a Ra 70-79	Fluorescent-standard		23 White	
	2b Ra 60-69	Fluorescent-standard		20 Cool-White	
		Metal halide		POWER STAR HQI/N	
		High pressure sodium			SON DE LUXE
Group 3	3 Ra 40-59	Fluorescent-standard			30 Warm-white
		High pressure mercury		MBF	MBF DE LUXE
Group 4	4 Ra 20-39	High pressure sodium			SON STANDARD SON PLUS

L·E·C·T·I·O·N

emitted by the lamp. The General Colour Rendering Index (Ra) has been established as a guide to the colour rendering properties of any lamp. A reference figure of Ra 100 is used to represent full colour reproduction across the visible spectrum, and the relative performance of each lamp is measured against this figure. For simplicity this is divided into 4 groups.

Colour appearance relates to the perceived colour of the source itself and has a significant influence on the environment. Lamps with a strong red/yellow content create a warm, relaxed atmosphere while those with a strong blue content create a crisp and clinical environment. Colour appearance is indicated by the Correlated Colour Temperature (CCT) and is based on the equivalent temperature of a tungsten filament in degrees Kelvin (K).

INSTALLATION

The particular performance characteristics of a lamp influence its suitability for a specific installation.

HQI lamps, for instance, offer excellent efficacy and colour performance but their requirement for control gear, run-up period, and need for a UV filter must also be considered.

SIZE/SHAPE

These influence the performance and the aesthetics of luminaire design. The compact size of the LVTH and HQI lamps makes them ideally suited for display lighting requiring narrow distribution from a discreet source, whereas the linear fluorescent lamp is appropriate for glare and shadow free lighting in commercial interiors.

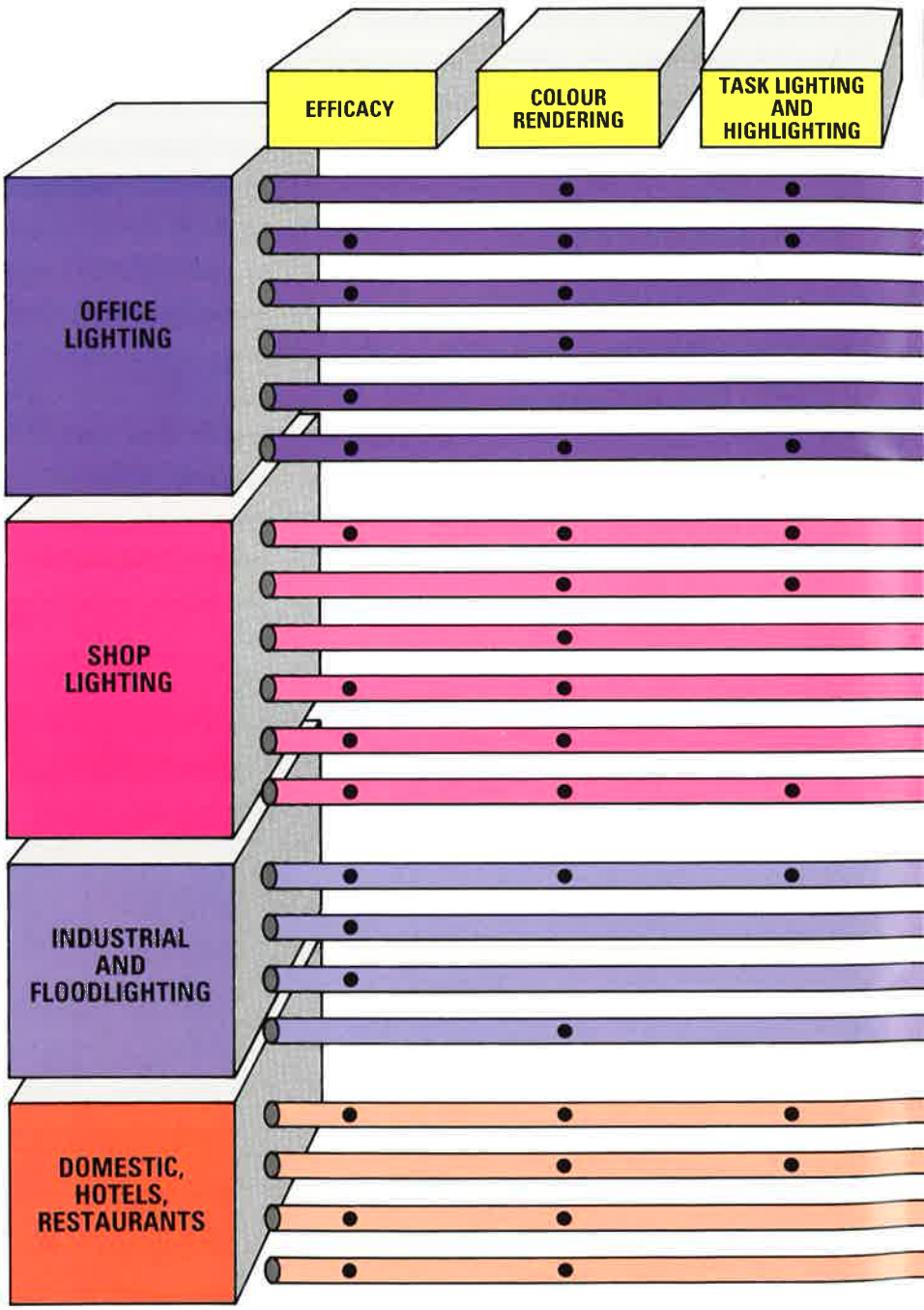
OPERATING LIFE

This is an important economic factor, since a viable scheme must account for ongoing replacement and maintenance costs. The longest operating life is provided by the discharge lamp range. However, lumen depreciation must be taken into consideration and a planned maintenance/replacement programme established for optimum cost effectiveness. When planning an installation, the selection of lamp type should be based on the best possible balance between these criteria.

L A M P S E

S E L E C T I

Modern light sources offer many advantages over their predecessors, and product development is taking place at an ever-increasing pace. This chart shows how the careful choice of these benefits allows specifiers to select the correct lamp for each application.



L · E · C · T · I · O · N

O N G U I D E

L O W V O
T U N G S T E N
H A L O

OSRAM'S comprehensive range of HALO STAR low voltage tungsten halogen (LVTH) lamps caters for a wide range of fittings and provides a compact, directional, energy-efficient light source with excellent colour performance. All the lamps have universal burning positions and are fully dimmable with suitably-rated transformers and dimmers.

The compact size and high performance of these lamps make them ideal for display lighting: they provide effective lighting control in neat and highly decorative fittings. The use of compact filaments provides the precise beam control required to create such effects as dramatic highlighting and wallwashing. LVTH lamps are superceding traditional incandescent lamps in many applications due to their improved light output and extended life provided by the tungsten halogen cycle with a low operating voltage. Two types are available: reflectors and capsules.

HALO STAR REFLECTORS

LVTH reflector lamps are available from 20 to 100 watts, with a choice of three beam widths: spot (up to 14°), medium (15-29°) and wide (30-55°).

COOL SPOT

This lamp has a multi-faceted dichroic-coated glass reflector which reduces heat emitted in the beam. Up to 60% is transmitted behind the lamp and away from the display area. This, together with the attractive sparkle of the reflector, makes it ideal for display applications, particularly where heat-sensitive products are involved.

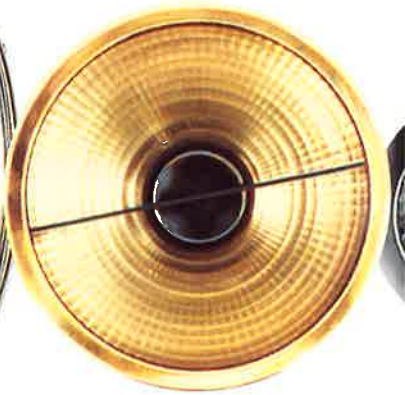
COOL SPOT is available with 35mm and 51mm diameter reflectors, each in three beam widths.

SUPER SPOT, MAXI SPOT and MINI SPOT

This versatile range of LVTH lamps employs multi-faceted aluminium reflectors and axial filaments that provide optimum performance across the three beam widths. They also feature a grip cover which greatly reduces glare and facilitates lamp replacement.

SUPER SPOT has a diameter of 111mm and is available in wattages from 50W to 100W. MAXI SPOT is 70mm in diameter, in wattages from 20W to 75W.

SUPER SPOT



MAXI SPOT

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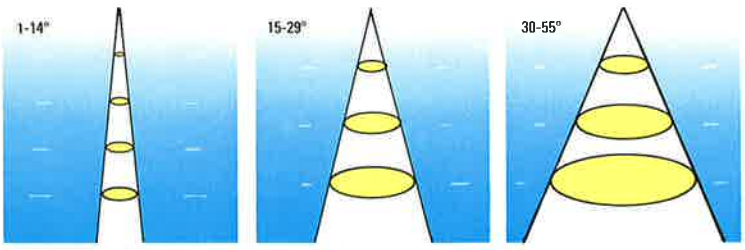
POWER BEAM

This lamp has a highly specular aluminium reflector utilising a multi-faceted design on the wider beam versions and has a toughened-glass front to protect against dust and finger marks.
POWER BEAM is rated at 50W, has a diameter of 58mm, and is available in spot, medium and wide beam widths. For creating special effects, versions are also available with glass fronts in different colours.

HALO STAR CAPSULES

These lamps have either axial or transverse filaments and are designed for use in fittings with integral reflectors. Endless distribution patterns can be achieved, and their size makes them ideally suited to applications where miniature fittings are required. The 50W M32 is also widely used in traffic signals.
Capsules are available in four ratings from 20W to 100W.

The 20W MINI SPOT has a diameter of 48mm.
MAXI SPOT and MINI SPOT are also available with gold reflectors to provide a warmer colour appearance.



MINI SPOT

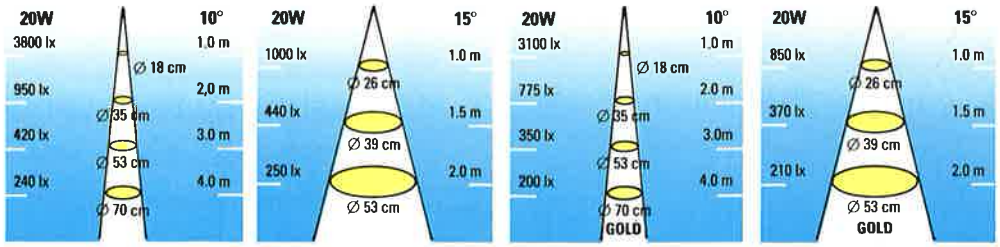
COOL SPOT

POWER BEAM

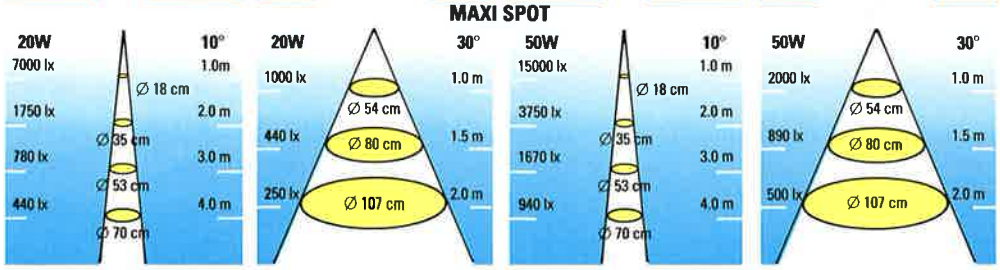
LOW VO
TUNGSTEN

HALO ST

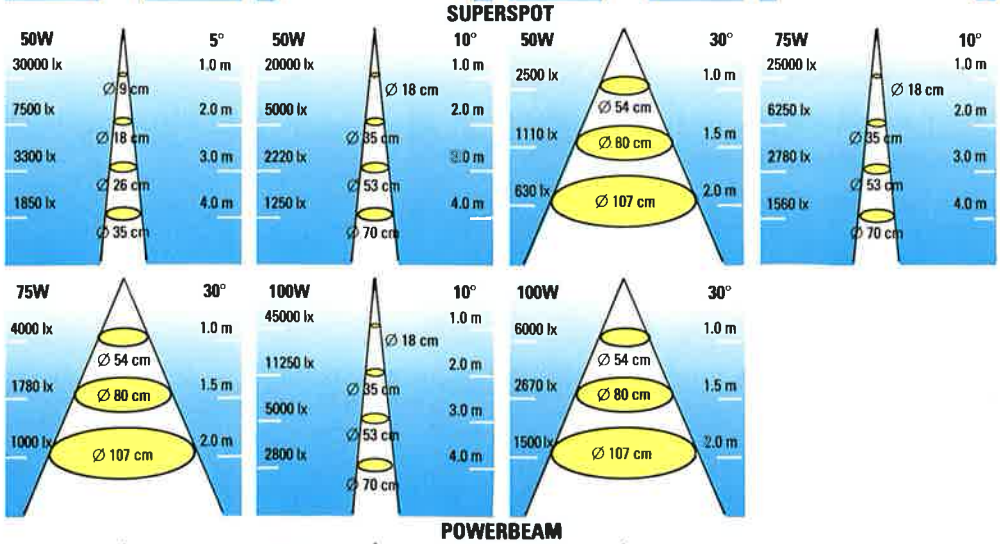
MINI SPOT



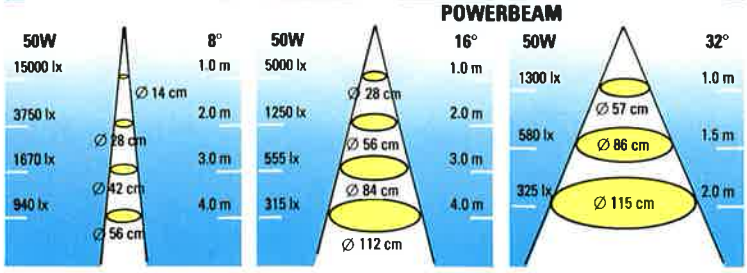
MAXI SPOT



SUPERSPOT



POWERBEAM



See Technical Notes p. 50

L·T·A·G·E
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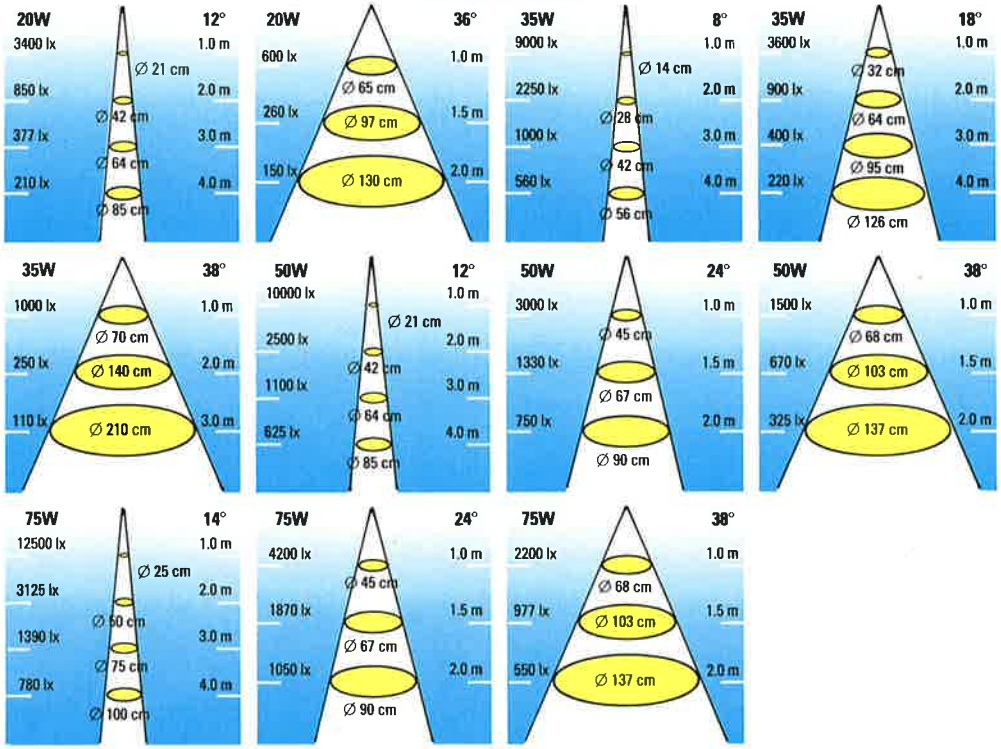
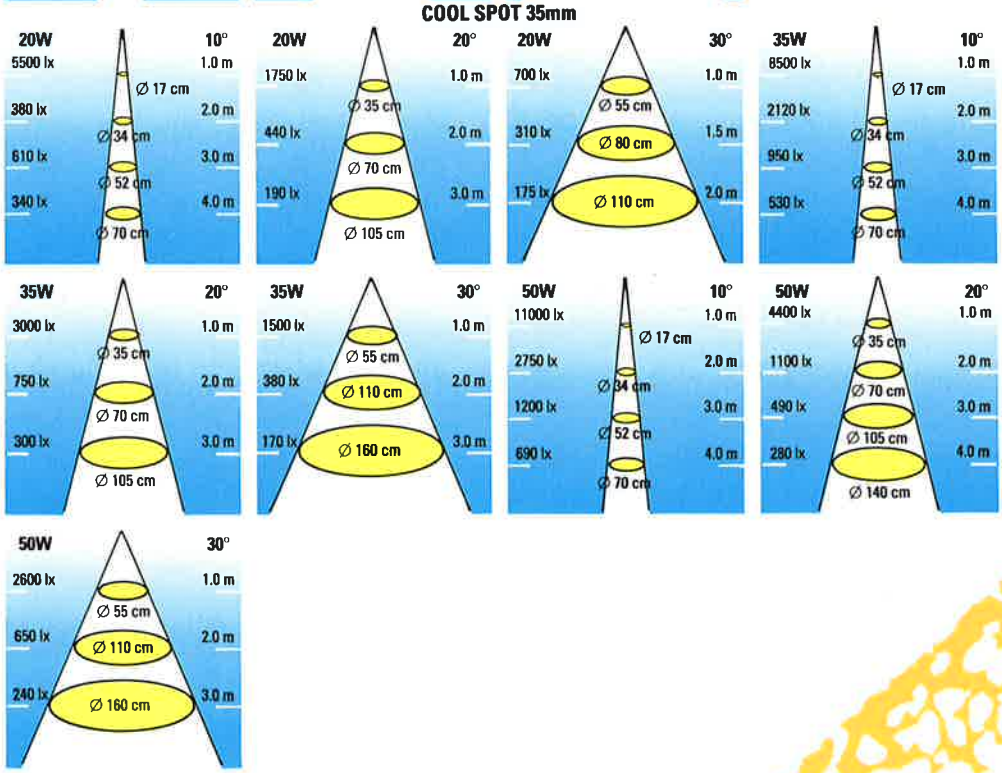
A R D A T A

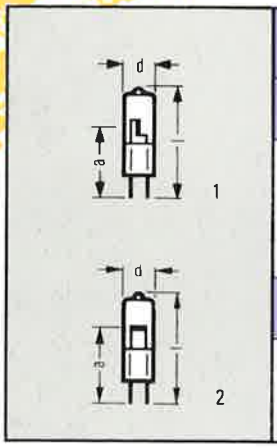
COOL SPOT 51mm



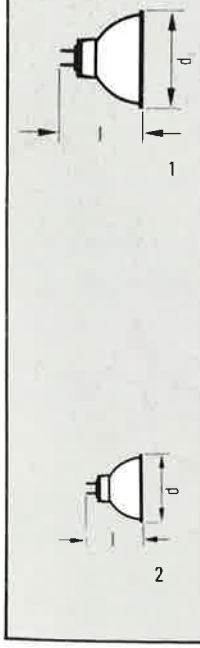
COOL SPOT 35mm



See Technical Notes p. 50



CODE	MANUF. CODE	WATTS	VOLTS	RATED LUMENS	DIMENSIONS mm			DIAG. NO.	RATED AVERAGE LIFE (h)	BASE/ CAP
					a	d	l			
AXIAL-FILAMENT CAPSULE LAMPS. Colour temperature: 3000K										
M179	64425AX	20	12	350	22	10	33	1	2000	GY4
M74	64440AX	50	12	1000	30	12	44	1	2000	GY6.35
M154	64450AX	75	12	1350	30	12	44	1	2000	GY6.35
M180	64458AX	100	12	2300	30	12	44	1	2000	GY6.35
TRANSVERSE-FILAMENT CAPSULE LAMPS Colour temperature: 3000K										
M47	64425	20	12	350	19.5	9	31	2	2000	G4
M32	46100	50	12	900	30	12	44	2	3000	GY6.35
M28	64458	100	12	2150	30	12	44	2	2000	GY6.35



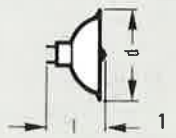
CODE	MANUF. CODE	ANSI CODE	WATTS	VOLTS	BEAM	LUMINOUS INTENSITY cd	DIMENSIONS mm		DIAG. NO.	RATED AVERAGE LIFE (h)	BASE/ CAP
							d	l			
COOL SPOT Diameter 51mm. Colour temperature: 3100K											
M68	41860SP	ESX	20	12	12° Spot	3400	51	45	1	2000	GX5.3
M69	41860WFL	BAB	20	12	36° Wide	600	51	45	1	2000	GX5.3
M71	41865SP	FRB	35	12	8° Spot	9000	51	45	1	3000	GX5.3
M70	41865FL	FRA	35	12	18° Medium	3600	51	45	1	3000	GX5.3
M81	41865WFL	FMW	35	12	38° Wide	1000	51	45	1	3000	GX5.3
M49	41870SP	EXT	50	12	12° Spot	10000	51	45	1	3000	GX5.3
M50	41870FL	EXZ	50	12	24° Medium	3000	51	45	1	3000	GX5.3
M58	41870WFL	EXN	50	12	38° Wide	1500	51	45	1	3000	GX5.3
M60	41880SP	EYF	75	12	14° Spot	12500	51	45	1	3500	GX5.3
M82	41880FL	EYJ	75	12	24° Medium	4200	51	45	1	3500	GX5.3
M61	41880WFL	EYC	75	12	38° Wide	2200	51	45	1	3500	GX5.3
COOL SPOT Diameter 35mm. Colour temperature: 3000K											
M52	41890SP	FTB	20	12	10° Spot	5500	35.3	34	2	2000	GZ4
M51	41890FL	FTC	20	12	20° Medium	1750	35.3	34	2	2000	GZ4
M62	41890MFL	FTD	20	12	30° Wide	700	35.3	34	2	2000	GZ4
M65	41892SP	FTE	35	12	10° Spot	8500	35.3	34	2	2000	GZ4
M66	41892FL	FTF	35	12	20° Medium	3000	35.3	34	2	2000	GZ4
M170	41892MFL	–	35	12	30° Wide	1500	35.3	34	2	2000	GZ4
M171	41894SP	–	50	12	10° Spot	11000	35.3	34	2	2000	GZ4
M172	41894FL	–	50	12	20° Medium	4400	35.3	34	2	2000	GZ4
M173	41894MFL	–	50	12	30° Wide	2600	35.3	34	2	2000	GZ4

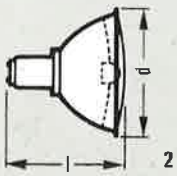
See Technical Notes p. 50

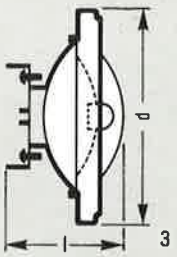
L T A G E
H A L O G E N

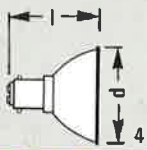
A R D A T A

CODE	MANUF. CODE	WATTS	VOLTS	BEAM	LUMINOUS INTENSITY cd	DIMENSIONS mm		DIAG. NO.	RATED AVERAGE LIFE (h)	BASE/ CAP
						d	l			
MINI SPOT Diameter 48mm. Colour temperature: 3000K										
M108	41900SP	20	12	10° Spot	3800	48	31	1	2000	G4
M164	41900FL	20	12	15° Medium	1000	48	31	1	2000	G4
MINI SPOT – GOLD Diameter 48mm. Colour temperature: 2600K										
M175	41905SP	20	12	10° Spot	3100	48	31	1	2000	G4
M176	41905FL	20	12	15° Medium	850	48	31	1	2000	G4
MAXI SPOT Diameter 70mm. Colour temperature: 3000K										
M155	41970SP	20	12	10° Spot	7000	70	50	2	2000	BA15d
M156	41970FL	20	12	30° Wide	1000	70	50	2	2000	BA15d
M157	41990SP	50	12	10° Spot	15000	70	50	2	2000	BA15d
M158	41990FL	50	12	30° Wide	2000	70	50	2	2000	BA15d
M159	41980SP	75	12	10° Spot	19000	70	50	2	2000	BA15d
M160	41980FL	75	12	30° Wide	4000	70	50	2	2000	BA15d
MAXI SPOT – GOLD Diameter 70mm. Colour temperature: 2600K										
M177	41995SP	50	12	10° Spot	13500	70	50	2	2000	BA15d
M178	41995FL	50	12	30° Wide	1800	70	50	2	2000	BA15d
SUPER SPOT Diameter 111mm. Colour temperature: 3000K										
M100	41835NSP	50	12	5° Spot	30000	111	45	3	2000	G53
M101	41835SP	50	12	10° Spot	20000	111	45	3	2000	G53
M161	41835FL	50	12	30° Wide	2500	111	50	3	2000	G53
M102	41840SP	75	12	10° Spot	25000	111	45	3	2000	G53
M162	41840FL	75	12	30° Wide	4000	111	50	3	2000	G53
M114	41850SP	100	12	10° Spot	45000	111	45	3	2000	G53
M152	41850FL	100	12	30° Wide	6000	111	50	3	2000	G53
POWER BEAM GLASS-FRONTED Diameter 58mm. Colour temperature: 3000K										
M83	–	50	12	8° Spot	15000	58	53	4	2000	B15d
M84	–	50	12	16° Medium	5000	58	56	4	2000	B15d
M85	–	50	12	32° Wide	1300	58	57	4	2000	B15d









See Technical Notes p. 50

L O W V O
T U N G S T E N

T R A N S F

The OSRAM range of 12V transformers includes both toroidal safety-isolating and electronic types.

The wire-wound toroidal transformers are rated from 20-400VA(W) and are all protected by integral, thermal cut-out devices. The TR200, TR300 and TR400 also have the added protection of electrical fuses on the input side.

All toroidal types are equipped with detachable fixing brackets to facilitate installation and are fully dimmable with appropriately rated dimmers.

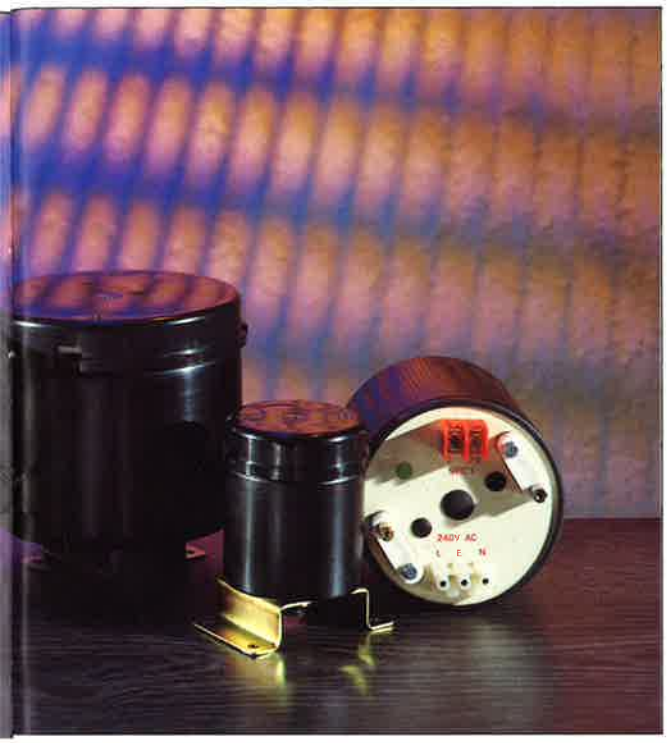
The electronic transformers utilise advanced microchip technology. The TR75E is suitable for single lamp applications up to 75W, while the HALOTRONIC HT80 can be used on multi-lamp circuits up to 80W. The HT80 is also suitable for dimming using standard phase-control dimmers.

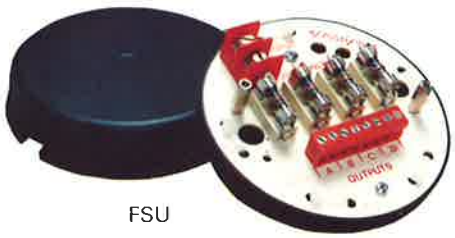
The OSRAM fused splitter unit provides four individually-fused output connections and is recommended for use on all multi-lamp circuits.

HALOTRONIC

L T A G E
H A L O G E N

O R M E R S



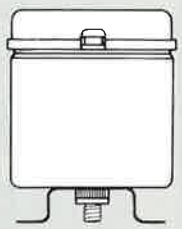


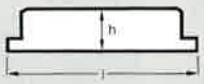
FSU

CABLE SIZE mm²	WIRING INFORMATION Maximum cable runs, source to load at 12V a.c., in metres This data does not apply to electronic transformers.					
	50VA	100VA	150VA	200VA	300VA	400VA
1.0	2.0	1.0	0.5	–	–	–
1.5	3.0	1.5	1.0	0.75	–	–
2.5	5.0	2.5	1.5	1.25	0.75	–
4.0	8.0	4.0	2.5	2.0	1.25	1.0
6.0	12.0	6.0	4.0	3.0	2.0	1.5

CODE	MAX RATING (VA)	MAXIMUM DIMENSIONS mm		WEIGHT kg
		HEIGHT	DIAMETER	
TR20	20	78	69	0.6
TR50	50	95	81	1.1
TR100	100	108	107	1.9
TR200	200	108	107	2.2
TR300	300	112	135	3.8
TR400	400	112	135	4.0
TR75E	75	127	32	0.16
HT80	80	h=35	b=42, l=150	0.22
FSU*	–	31	118	0.15

* Includes 4 x 5A fuses.





HT80

See Technical Notes p. 50

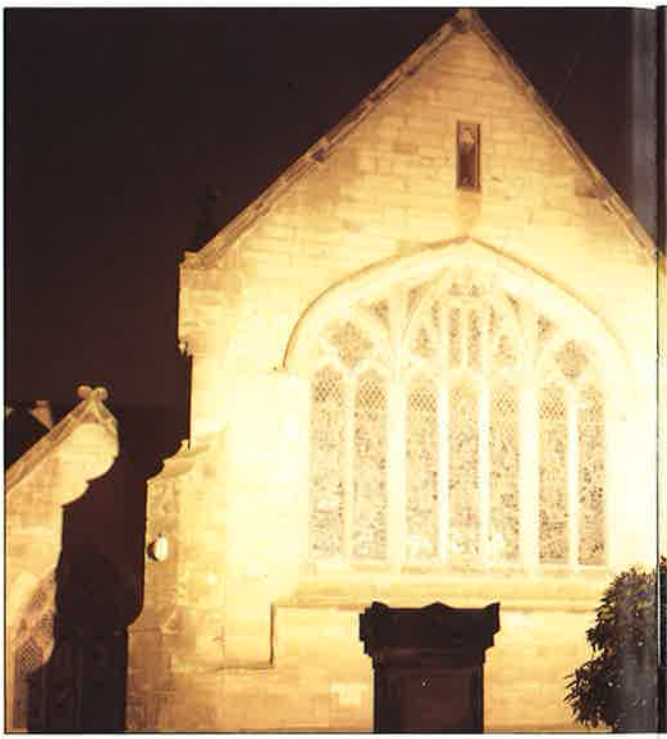
M·A·I·N·S V
T·U·N·G·S·T·E·N

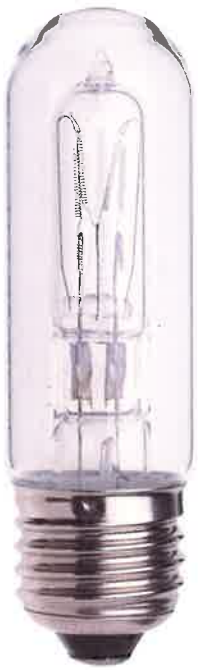
H A L O

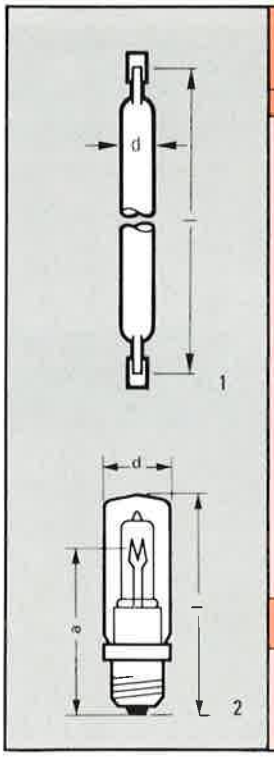
OSRAM's comprehensive range of HALO STAR mains-voltage tungsten halogen lamps includes M class single-ended and K class double-ended types. Both are suitable for use in display applications and, being mains voltage, do not require control gear.

The linear double-ended range is well suited to smaller floodlighting installations, while the compact single-ended lamps are better suited for use in decorative fittings and as auxiliary lamps in HID luminaires where instant illumination is required.

The E27 single-ended types have universal burning positions but the double-ended lamps should only be operated within 15° of the horizontal. The whole range is fully dimmable.





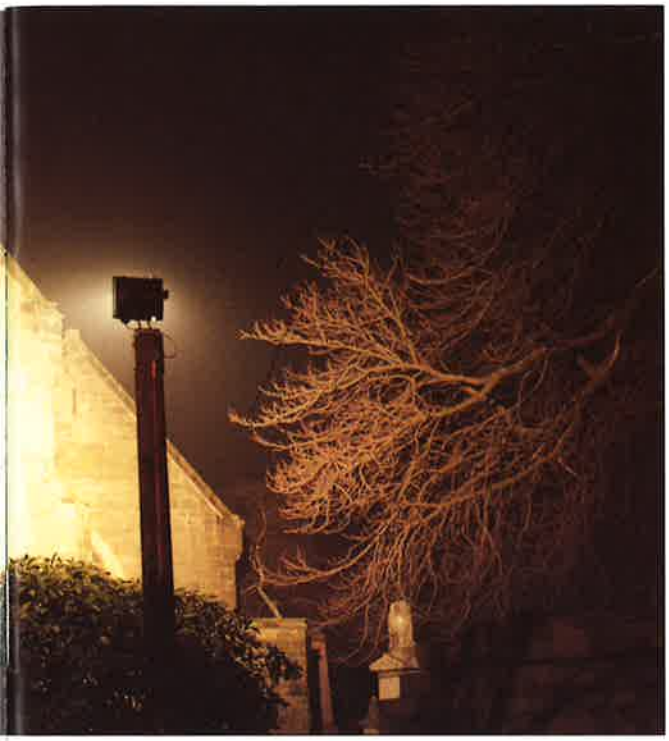


CODE	WATTS	VOLTS	RATED LUMENS
DOUBLE EN			
K11	200	240/250	3100
K9LV	300	110/115	5250
K9A	300	220/230	5000
K9	300	240/250	5000
KILV	500	110/115	10500
KIA	500	220/230	9500
KI	500	240/250	9500
K3A	750	220/230	15000
K3	750	240/250	15000
K4LV	1000	110/115	22000
K4A	1000	220/230	21000
K4	1000	240/250	21000
K5A	1500	220/230	32000
K5	1500	240/250	32000
SINGLE ENDED			
M150	150	240/250	2500
M151	250	240/250	4200
M40	500	240	8500

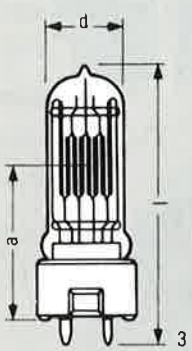
See Technical Notes p. 50

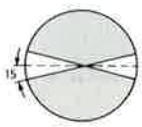
·O·L·T·A·G·E
H·A·L·O·G·E·N

S T A R

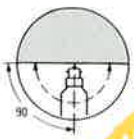


DIMENSIONS			DIAGRAM NO.	RECOMMENDED FUSING (HBC Type)	COLOUR TEMPERATURE (K)	BASE/ CAP
l	d	a				
DED LINEAR Rated Average Life 2000 h. Burning position: H15						
114.2	12	–	1	2A	2800	R7s
114.2	12	–	1	6A	2900	R7s
114.2	12	–	1	4A	2850	R7s
114.2	12	–	1	4A	2850	R7s
114.2	12	–	1	6A	3000	R7s
114.2	12	–	1	4A	2950	R7s
114.2	12	–	1	4A	2950	R7s
185.7	12	–	1	6A	3000	R7s
185.7	12	–	1	6A	3000	R7s
185.7	12	–	1	10A	3050	R7s
185.7	12	–	1	6A	3050	R7s
185.7	12	–	1	6A	3050	R7s
250.7	12	–	1	10A	3050	R7s
250.7	12	–	1	10A	3050	R7s
ated Average Life 2000 h. Burning position: Universal except M40 V90						
105	31	75	2	–	2900	E27
105	31	75	2	–	2900	E27
90	23	46·5	3	–	2900	GY9·5





H15



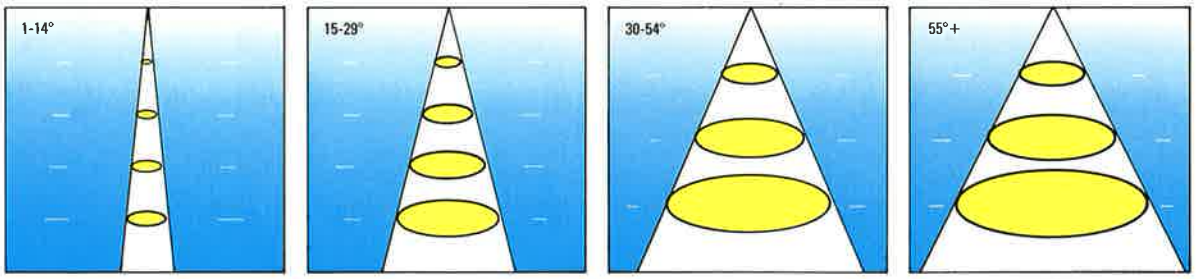
V90

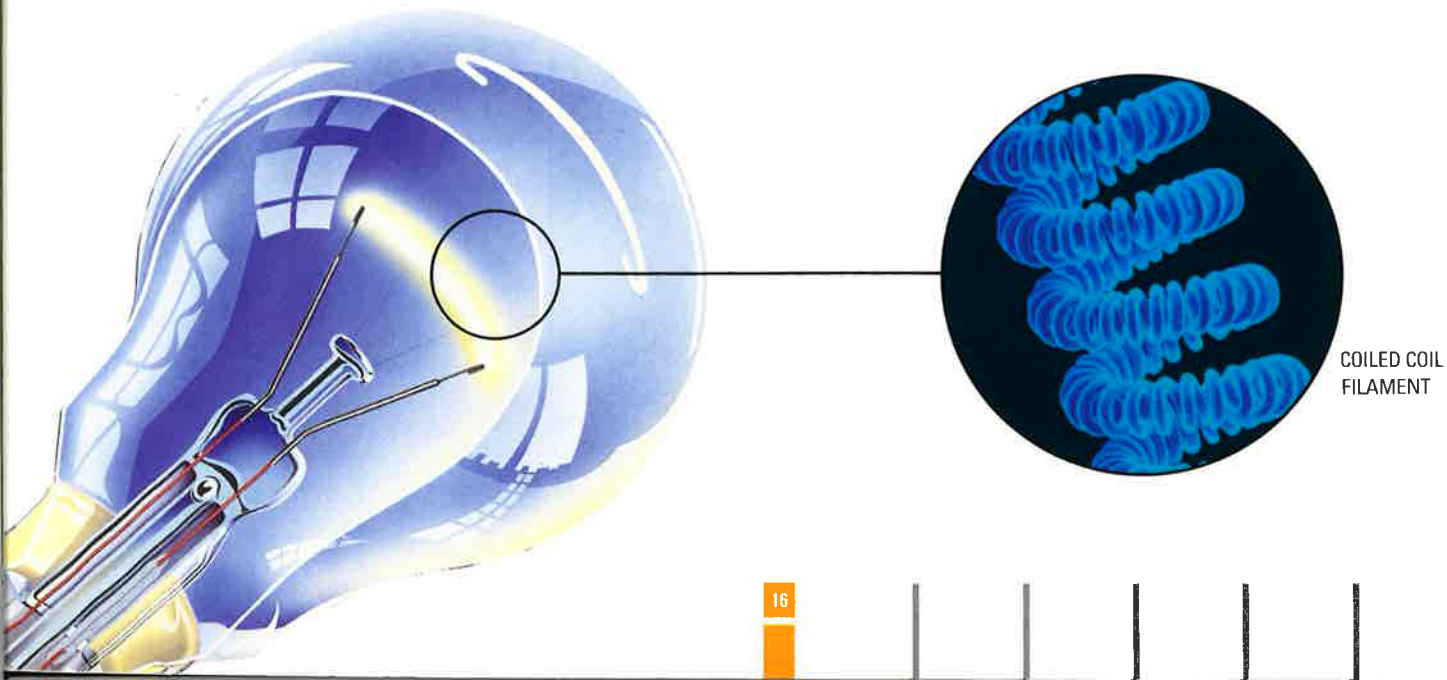
For indoor use, these lamps (except M150 and M151) should be used in fittings incorporating a suitable safety screen.

G·E·N·E·R·A·L
S·E·R·

S T A N D A R D A N

OSRAM offers a wide range of incandescent lamps including standard General Lighting Service (GLS), decorative and reflector types, as well as lamps for special applications.
The variety of lamp types and the lack of any control gear requirements allow great flexibility in application and luminaire design.
Where applicable, OSRAM lamps incorporate a special safety device – the minarc fuse – which protects against possible transient current surges at the end of normal life. Other lamps are fitted with internal fuses, where necessary, to reduce the risk of sub-circuit fuse failure.
The design life for most GLS lamps is set at 1,000 hours. However, operating conditions, particularly supply voltage and burning position, will affect achieved life.
As can be seen from the graph, an increase in supply voltage of as little as 5% will increase lumen output by as much as





L·I·G·H·T·I·N·G V·I·C·E

D R E F L E C T O R S

LECTOR
M WIDTHS

20% but will also decrease expected life by 50%. It is therefore important to correctly match lamps with the supply voltage.

The GLS range consists of standard types and reflectors.

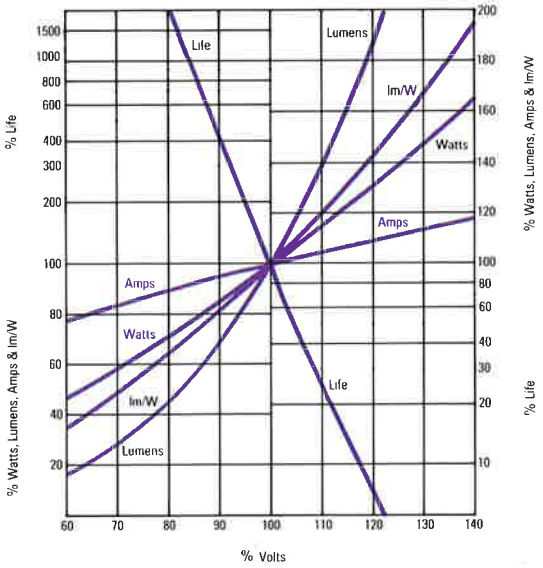
STANDARD

These include the popular EXTRALITE and FILTALITE and the stylish, double-life ACCENT, and lamps for decorative lighting: COLOURED, CANDLE and GLOBE. For more specialised use, ROUGH SERVICE, SLUMBER LIGHT, FIREGLOW, PYGMY and CARBON HEATER are available.

REFLECTORS

Reflector lamps give a distinct beam which makes them ideal for display purposes. PAR 38 and the economy version, PAR 38 EC, are suitable for interior and exterior use. The

VARIATIONS OF TUNGSTEN FILAMENT LAMP CHARACTERISTICS WITH CHANGE IN VOLTAGE



CONCENTRA range offers general purpose reflectors in different sizes, while SICCATHERM infra-red lamps give localised heat and light.

LUMEN OUTPUT

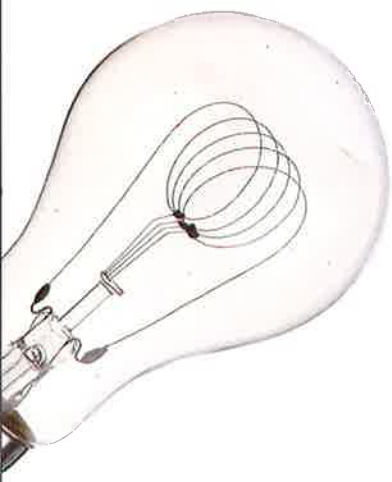
WATTS	EXTRALITE 240V RATED LUMENS	SINGLE COIL 240V** RATED LUMENS	SINGLE COIL 110/120V* RATED LUMENS	SINGLE COIL 50V RATED LUMENS	SINGLE COIL 25V RATED LUMENS
15		110			
25	225		225	275	290
40	410		440	480	540
60	700		760	830	930
75	940				
100	1330		1420	1520	1620
150	2140				
200	2990				
300		4550	5000		
500		8200	8900		
750		13200			
1000		18400	19300		
1500		28700	30000		

* Measured at 117V.
** Light outputs of 250V lamps are about 1% lower.

See Technical Notes p. 50

G·E·N·E·R·A·L S·E·R·

D A



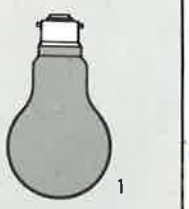
WATTS	VOLTS	CAP	FINISH	DIAG NO
EXTRALITE Coiled coil filament for higher light output.				
25	240	BC	Pearl/Clear	1
40	240, 250	BC/ES	Pearl/Clear	1
60	240, 250	BC/ES	Pearl/Clear	1
75	240, 250	BC	Pearl/Clear	1
100	240, 250	BC/ES	Pearl/Clear	1
150	240, 250	BC	Pearl/Clear	1
200	240	BC	Pearl	1
SINGLE COIL General purpose lamp.				
15	240	BC	Pearl/Clear	1
25	25, 50, 100/120	BC	Pearl	1
40	25, 50, 110/120	BC/ES	Pearl	1
60	25, 50, 110/120	BC/ES	Pearl	1
100	25, 50, 110/120	BC/ES	Pearl	1
300	110/120, 240, 250	GES	Clear	1
500	110/120, 240, 250	GES	Clear	1
750	240, 250	GES	Clear	1
1000	240, 250	GES	Clear	1
1500	240, 250	GES	Clear	1
ACCENT Stylish shape with a soft light. Double life.				
40	240	BC	Opal	2
60	240	BC	Opal	2
100	240	BC	Opal	2
FILTALITE Mushroom shape				
40	240	BC	Opal	3
60	240	BC	Opal	3
100	240	BC	Opal	3
ROUGH SERVICE Additional filament supports resist vibration.				
40	110/120, 220/250	BC	Pearl	4
60	110/120	BC	Pearl	4
60	220/250	BC/ES	Pearl	4
100	110/120, 220/250	BC/ES	Pearl	4
SLUMBER LIGHT Low wattage lamp for night lights.				
LOW	240	BC	Pearl	1
CARBON HEATER Carbon filaments for heating or decorative use.				
65	230/250	BC	Clear	5
130	230/250	BC	Clear	5
200	230/250	BC	Clear	5

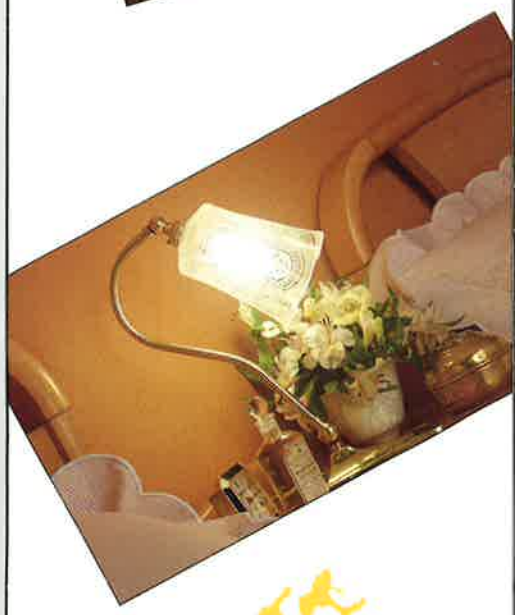
See Technical Notes p. 50

L·I·G·H·T·I·N·G
V·I·C·E

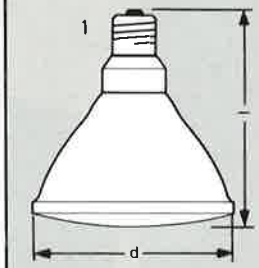
T A

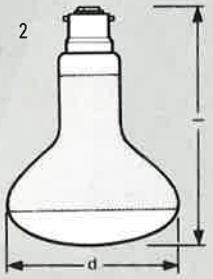
WATTS	VOLTS	CAP	FINISH	DIAG NO
FIREGLOW Clear, red lamp for flame effect fires.				
40	240	BC	Red lacquered	1
60	240	BC/3 PIN BC	Red lacquered	1
STRIPLIGHT 26mm diameter linear lamp 221mm & 284mm respectively.				
30	240	S15s	Clear/Opal	2
60	240	S15s	Clear/Opal	2
PYGMY Miniature lamp.				
15	110/120	BC/SBC	Clear	3
15	240	BC/SBC/SES	Clear	3
25	240	BC/SBC	Clear	3
15	240	BC/SBC	Amber, Blue, Green Pink, Red, Yellow	3
GLOBE Round, decorative lamp. Plain or coloured.				
95mm				
60	240	BC	Opal	4
100	240	BC	Opal	4
60	240	BC	Pastel Pink, Peach, Lemon	4
68mm				
60	240	BC	Opal	4
45mm				
25	240	BC/SBC/SES	Opal	4
40	240	BC/SBC/SES	Opal	4
COLOURED Standard GLS shape with coloured coatings.				
15	240	BC/ES	Amber	1
25	240	BC	Blue	1
40	240	BC	Green, Yellow	1
60	240	BC	Red / Pink	1
CANDLE Small lamp for decorative or small fittings.				
TWISTED				
35mm				
40	240	BC/SBC	Clear	5
60	240	BC/SBC	Clear	5
47mm				
60	240	BC	Clear	5
PLAIN				
35mm				
25	240	BC/SBC/SES	Clear	6
25	240	BC/SBC	Opal	6
40	240	BC/SBC/SES	Clear/Opal	6
60	240	BC/SBC	Clear/Opal	6
45mm				
60	240	BC/SBC	Clear/Opal	6



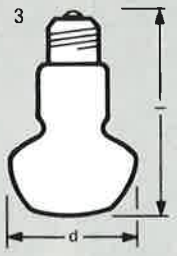


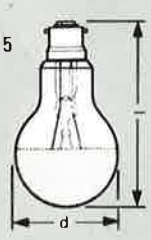
See Technical Notes p. 50





(R95 shown)





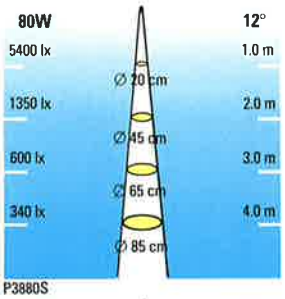
CODE	WATTS	VOLTS	BEAM	LUMINOUS INTENSITY cd	DIMENSIONS mm		DIAG NO.	BASE/ CAP
					d	l		
PAR 38 EC High efficacy and 2000h life								
P3880S	80	240	Spot	5400	123.5	136	1	ES
P3880F	80	240	Wide	1800	123.5	136	1	ES
P3812S	120	240	Spot	9300	123.5	136	1	ES
P3812F	120	240	Wide	3100	123.5	136	1	ES
PAR 38								
P3810S	100	240/250	Medium	3500	123	138	1	ES
P3810F*	100	240/250	Wide	1450	123	138	1	ES
P3815S	150	240/250	Medium	6200	123	138	1	ES
P3815F	150	240/250	Wide	2600	123	138	1	ES
R95 CONCENTRA								
R75	75	240/250	Wide	1000	95	134	2	BC
R75E	75	240/250	Wide	1000	95	134	2	ES
R100	100	240/250	Wide	1350	95	134	2	BC
R100E	100	240/250	Wide	1350	95	134	2	ES
R80 CONCENTRA								
R840*	40	240	Flood	120	81	112.5	2	BC
R840E*	40	240	Flood	120	81	114	2	ES
R860*	60	240	Flood	200	81	112.5	2	BC
R860E*	60	240	Flood	200	81	114	2	ES
R875	75	240	Flood	280	81	112.5	2	BC
R875E	75	240	Flood	280	81	114	2	ES
R8100	100	240	Flood	400	81	112.5	2	BC
R8100E	100	240	Flood	400	81	114	2	ES
R63 CONCENTRA								
R640*	40	240	Wide	280	64.5	103.5	2	BC
R640E*	40	240	Wide	280	64.5	105	2	ES
R660	60	240	Wide	700	64.5	103.5	2	BC
R660E	60	240	Wide	700	64.5	105	2	ES
R60 CONCENTRA								
R6340E	40	240	Wide	500	60	103	3	ES
R6360E	60	240	Wide	900	60	103	3	ES
R50 CONCENTRA								
R540E	40	240	Wide	380	51	86	4	SES
SICCATHERM SOFT-GLASS INFRA RED – NOT SUITABLE FOR DOMESTIC USE								
IRELV	250	110/130	–	–	127	185	2	ES
IRE	250	220/250	–	–	127	185	2	ES
IRERF	250	220/250	–	–	127	185	2	ES
SICCATHERM HARD-GLASS INFRA RED								
IRHG	275	220/250	–	–	128	186.5	2	BC
IREHG	275	220/250	–	–	128	188	2	ES
CROWN SILVER								
BS60	60	240	–	–	69	128.5	5	BC
BS60E	60	240	–	–	69	130	5	ES
BS100	100	240	–	–	69	128.5	5	BC
BS100E	100	240	–	–	69	130	5	ES

* COLOURS
To specify coloured lamps, add a suffix to the code as follows:
B = blue, G = green, R = red, Y = yellow
(For PAR 38, this suffix is added to P38...)

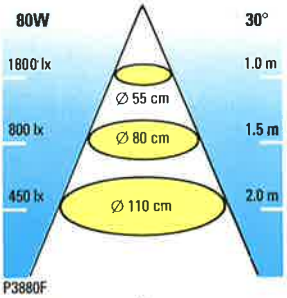
See Technical Notes p. 50

L·I·G·H·T·I·N·G
V·I·C·E

T A



P3880S



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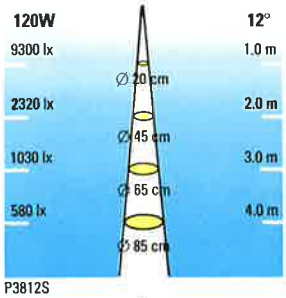
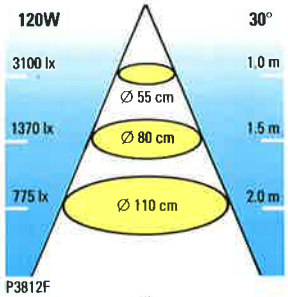


P3812S



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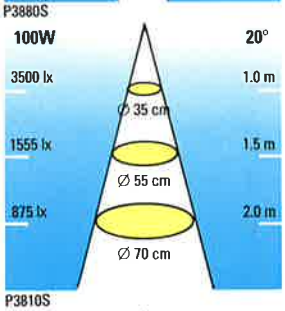
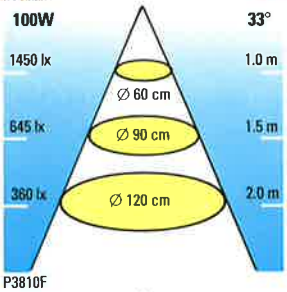
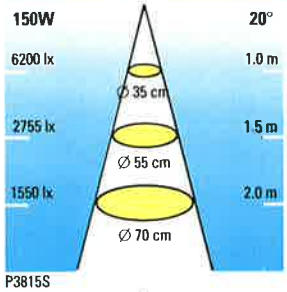


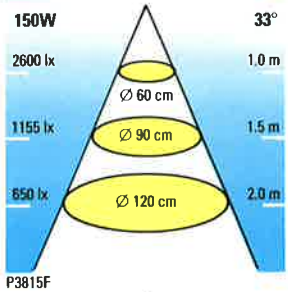
P3810S



P3810F



P3815S



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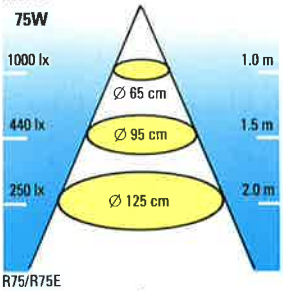
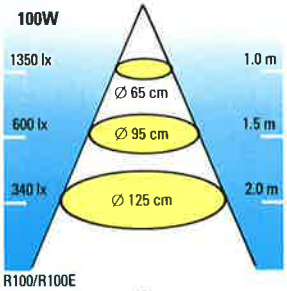
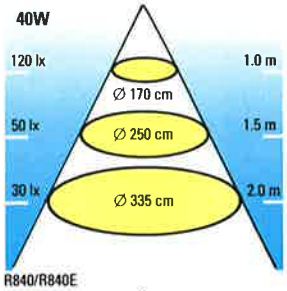


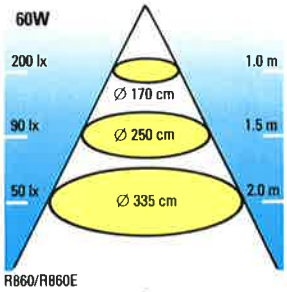
R75/R75E



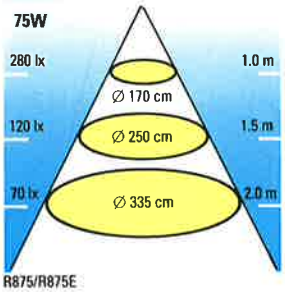
R100/R100E



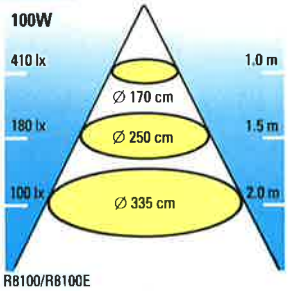
R840/R840E



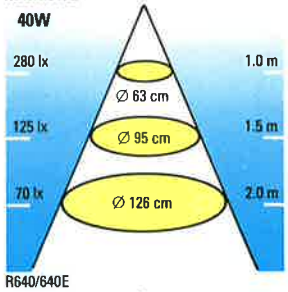
R860/R860E



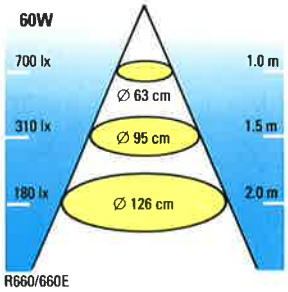
R875/R875E



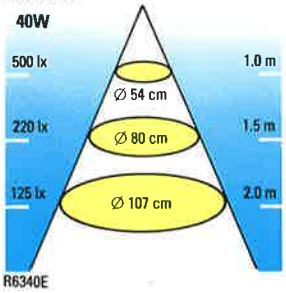
R8100/R8100E



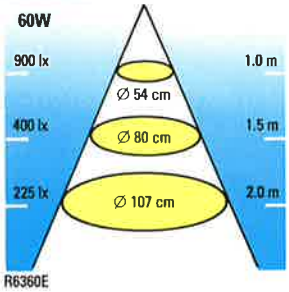
R640/640E



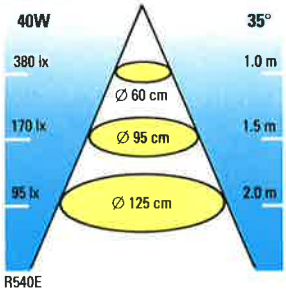
R660/660E



R6340E



R6360E



R540E

See Technical Notes p. 50

COM
FLUOR

OP

Since first being introduced by OSRAM, the fluorescent tube has undergone continuous development, much of it relating to advancement in fluorescent coatings which has substantially improved both efficacy and colour performance.

With the advent of OSRAM LUMILUX triphosphors, which are able to withstand the higher discharge intensity created in smaller tubes, came the significant development of the OPUS compact fluorescent lamp. This is a highly-efficient, compact light source with extended life and cool running which can effectively replace traditional tungsten lamps.

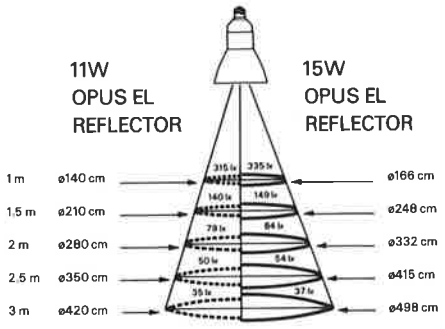
This range provides a number of styles and sizes to suit a wide variety of applications.

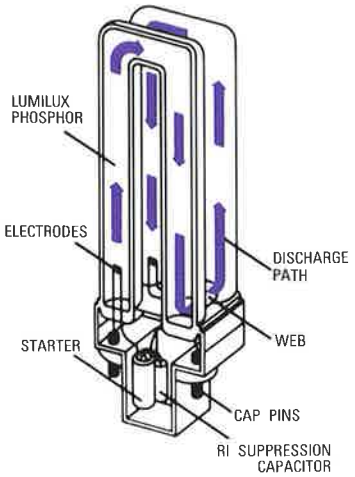
OPUS EL

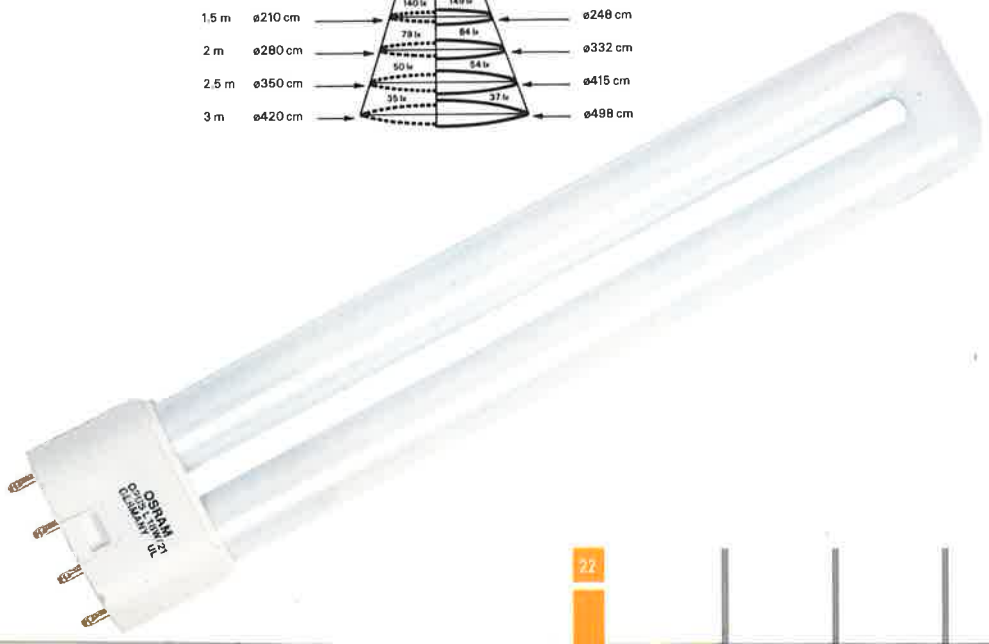
A direct, plug-in replacement for the GLS lamp. Available with BC or ES cap, it is complete with lightweight, integral, electronic control gear and combines efficient running with an instant flicker-free start.

OPUS EL Reflector

An equivalent direct replacement for incandescent reflector lamps. A highly-polished polycarbonate reflector provides medium or wide beam performance.







P A C T
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U S

OPUS S

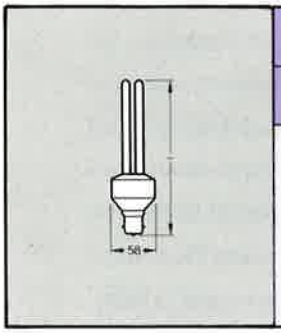
A slim profile lamp allowing compact and creative luminaire design. The standard OPUS S has an internal starter, while the 4-pin OPUS S/E requires external starting, allowing use on emergency, low-voltage DC (for boats, caravans, etc.) and dimming circuits. OPUS S is available in OPUS JAZZ coloured versions.

OPUS D

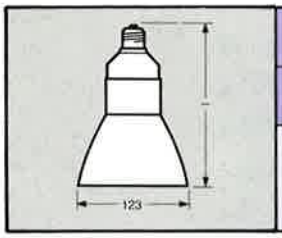
These have a double-turn tube which achieves a higher wattage from a shorter length. This shape also gives a symmetrical light output and is ideal for use in downlight applications. The 2-pin OPUS D has an internal starter, while the 4-pin OPUS D/E requires external starting, allowing use on circuits as noted under OPUS S/E.

OPUS L

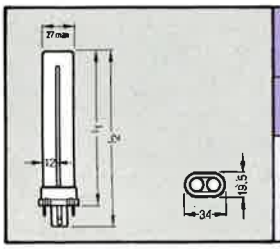
A compact alternative to the conventional fluorescent tube offering equivalent light output, the shorter length of the single-ended OPUS L allows greater freedom in luminaire design and office module planning. The 4-pin OPUS L can be used on High Frequency electronic or conventional control gear with starter. OPUS L is available in 2700K (Warm) as well as 3000K (Warm-white) and 4000K (Cool-white) to match conventional LUMILUX tube colours.



CODE	WATTS	RATED LUMENS	LAMP CURRENT (A)	CIRCUIT WATTS	DIMENSION l	WEIGHT g	POWER FACTOR	BASE/ CAP
OPUS EL 240V Integral Electronic Control Gear – 2700K Warm Universal Burning								
OP7BC	7	400	0.085	7.5	145	115	0.5	B22d
OP7ES	7	400	0.085	7.5	145	115	0.5	E27
OP11BC	11	600	0.115	11.5	145	115	0.5	B22d
OP11ES	11	600	0.115	11.5	145	115	0.5	E27
OP15BC	15	900	0.145	15	175	130	0.5	B22d
OP15ES	15	900	0.145	15	175	130	0.5	E27
OP20BC	20	1200	0.190	20	207	140	0.5	B22d
OP20ES	20	1200	0.190	20	207	140	0.5	E27



CODE	WATTS	BEAM ANGLE	LUMINOUS INTENSITY cd	LAMP CURRENT (A)	CIRCUIT WATTS	DIMENSION l	WEIGHT g	POWER FACTOR	BASE/ CAP
OPUS EL Reflector 240V Integral Electronic Control Gear - 2700K Warm Universal Burning									
OP11BR	11	70°	315	0.115	11.5	148	185	0.5	B22d
OP11ER	11	70°	315	0.115	11.5	148	185	0.5	E27
OP15BR	15	80°	335	0.145	15	183	225	0.5	B22d
OP15ER	15	80°	335	0.145	15	183	225	0.5	E27



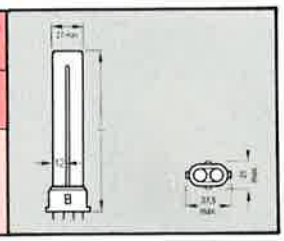
CODE	WATTS	RATED LUMENS		LAMP CURRENT (A)	DIMENSION		BASE/ CAP	BALLAST	
		SINGLE	SERIES PAIR		l_1	l_2		SINGLE	SERIES PAIR
OPUS S Compact Size with integral starter - 2700K Warm Universal Burning									
OP5	5	250	500	0.18	85	108	G23	BFC11S	BFC209S
OP7	7	400	800	0.18	115	138	G23	BFC11S	BFC209S
OP9	9	600	950	0.17	145	168	G23	BFC11S	BFC209S
OP11	11	900	–	0.16	215	238	G23	BFC11S	–

See Technical Notes p. 50

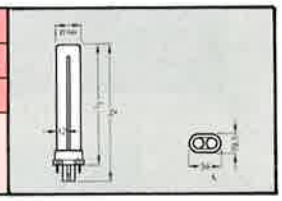
P A C T
E S C E N T

D A T A

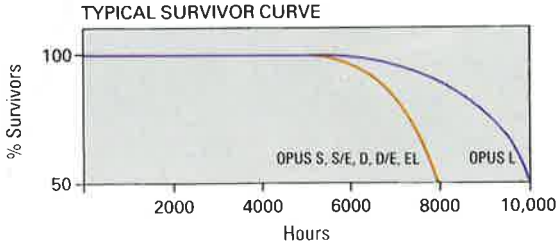
CODE	WATTS	RATED LUMENS	LAMP CURRENT (A)	DIMENSION l	BASE/ CAP
OPUS S/E. Compact size without starter - 2700K Warm Universal Burning					
OP5SE	5	250	0.18	85	2G7
OP7SE	7	400	0.18	115	2G7
OP9SE	9	600	0.17	145	2G7
OP11SE	11	900	0.16	215	2G7



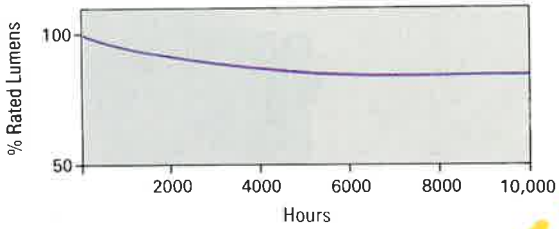
CODE	WATTS	COLOUR	LAMP CURRENT (A)	DIMENSIONS		BASE/ CAP	BALLAST	
				l_1	l_2		SINGLE	SERIES PAIR
OPUS S JAZZ. Coloured with Integral starter. Universal Burning								
OP9R	9	Red	0.17	145	168	G23	BFC11S	BFC209S
OP9G	9	Green	0.17	145	168	G23	BFC11S	BFC209S
OP9B	9	Blue	0.17	145	168	G23	BFC11S	BFC209S



TYPICAL SURVIVOR CURVE

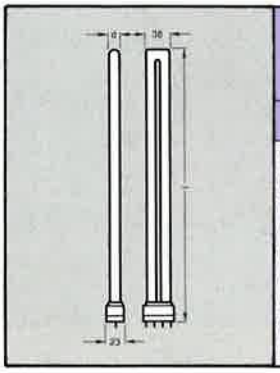


TYPICAL LUMEN MAINTENANCE

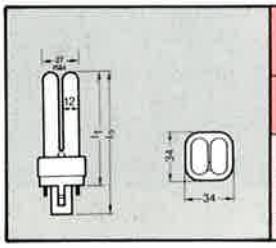


COM FLUOR

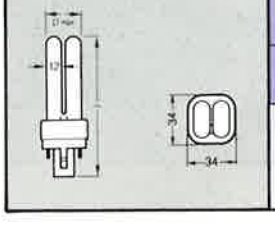
OPUS



CODE	WATTS	COLOUR APPEARANCE	NOMINAL COLOUR TEMP. K	RATED LUMENS
OPUS L. Linear style				
OP18L2	18	Cool-white	4000	1200
OP18L3	18	Warm-white	3000	1200
OP18L4	18	Warm	2700	1200
OP24L2	24	Cool-white	4000	1800
OP24L3	24	Warm-white	3000	1800
OP24L4	24	Warm	2700	1800
OP36L2	36	Cool-white	4000	2900
OP36L3	36	Warm-white	3000	2900
OP36L4	36	Warm	2700	2900



CODE	WATTS	RATED LUMENS	LAMP CURRENT (A)	DIMENSIONS l_1	DIMENSIONS l_2	BASE/ CAP	BALLAST
OPUS D. Double Turn Tube with Integral starter -2700K Warm Universal Burning							
OP10D	10	600	0.19	95	118	G24d-1	BFC13D
OP13D	13	900	0.165	130	153	G24d-1	BFC13D
OP18D	18	1200	0.22	150	173	G24d-2	BFC18D
OP26D	26	1800	0.315	170	193	G24d-3	BFC26D



CODE	WATTS	RATED LUMENS	LAMP CURRENT (A)	DIMENSIONS l_1	DIMENSIONS l_2	BASE/ CAP
OPUS D/E. Double turn tube without starter -2700K Warm Universal Burning						
OP10DE	10	600	0.19	95	118	G24q-1
OP13DE	13	900	0.165	130	153	G24q-1
OP18DE	18	1200	0.22	150	173	G24q-2
OP26DE	26	1800	0.315	170	193	G24q-3

See Technical Notes p. 50

P A C T
E S C E N T

D A T A

LAMP CURRENT (A)	DIMENSION	BASE/ CAP	CONTROL GEAR		
	l		BALLAST	STARTER	CAPACITOR
style without starter. Universal Burning					
0.37	225	2G11	BF24	155/200	PFC04S
0.37	225	2G11	BF24	155/200	PFC04S
0.37	225	2G11	BF24	155/200	PFC04S
0.345	320	2G11	BF24	155/500	PFC035S
0.345	320	2G11	BF24	155/500	PFC035S
0.345	320	2G11	BF24	155/500	PFC035S
0.43	415	2G11	BF40	155/500	PFC04S
0.43	415	2G11	BF40	155/500	PFC04S
0.43	415	2G11	BF40	155/500	PFC04S

F·L·U·O·R·

F L U O R E S C

Fluorescent tubes offer the widest possible choice in colour and performance to suit differing demands and environmental requirements. The OSRAM range consists of three types: the latest LUMILUX triphosphor tubes; STANDARD halophosphate; and EVERSUN ultraviolet.

LUMILUX TRIPHOSPHOR

These triphosphor tubes provide the ideal solution in environments such as offices and shops, where high efficacy is required, with good colour rendering. LUMILUX DE LUXE provide optimum performance with even higher colour rendering, for more demanding uses such as printing and fashion stores.

STANDARD HALOPHOSPHATE

For more general applications, such as circulation and storage areas 26 mm (T8) standard halophosphate tubes offer a significant improvement in efficiency over traditional 38 mm (T12) types, and can be used as a direct replacement on switch start circuits.

T12 tubes are appropriate for use with switch and switchless start control gear or in adverse conditions, such as low temperatures. They are available in both standard and specialist colours to meet specific requirements. OSRAM also offer a full range of T5 and circular fluorescent tubes for use in applications such as bulkhead and domestic fittings.

COLOUR APPEARANCE	TYPICAL EFFICACY lm/W	COLOUR TEMPERATURE K	Ra INDEX GROUP
11 LUMILUX Daylight	90	6300	80-89
12 LUMILUX DE LUXE Daylight	65	6500	90-100
21 LUMILUX Cool-white	93	4000	80-89
22 LUMILUX DE LUXE Cool-white	65	4000	90-100
31 LUMILUX Warm-white	93	3000	80-89
32 LUMILUX DE LUXE Warm-white	65	3000	90-100
41 LUMILUX Warm	93	2700	80-89
23 White	82	3450	40-59
20 Cool-white	80	4300	60-69
30 Warm-white	80	3100	40-59
– Natural	58	4000	80-89
– Colour-matching	53	6500	90-100
– De luxe warm-white	55	2850	60-69
– De luxe natural	40	3350	90-100

·E·S·C·E·N·T

C E N T T U B E S

In addition to colour rendering and efficacy, selection of the tube with the colour appearance that is best suited to the environment is important.

WHITE – Intermediate colour suitable for most commercial areas.

WARM-WHITE – Warmer colour for leisure and social areas, as well as offices and meeting rooms.

COOL-WHITE – Ideal for offices, shops and schools where "clean" colour is required.

WARM – Incandescent-like colour, well suited to social areas such as hotels and restaurants.

DAYLIGHT – Creates a bright appearance across the colour spectrum. Well suited to clothes shops, textile manufacturing and printing.

NATURAL – A cool colour with relatively good colour rendering.

DE LUXE NATURAL – Very good colour rendering with a warmer colour. Often used for meat display.

DE LUXE WARM WHITE – A warm colour similar to incandescent light.

COLOUR-MATCHING– Excellent colour rendering with very cool appearance.

EVERSUN

These ultra-violet tubes are specifically designed for cosmetic tanning in domestic and commercial sunbeds. The pink and blue tube ranges have a reduced UVB output and can be used throughout the year.

The Super UV tubes emit higher UVB levels and provide a quicker, long-lasting tan.

The reflector UV tubes have an increased forward output ratio resulting in improved efficiency.

Caution: These tubes emit UV radiation and should only be used in a sunbed with a timer, and in accordance with the appliance manufacturer's instructions.

STANDARD T8 HALOPHOSPHATE, KRYPTON-FILLED Diameter: 26mm Cap: G13 Burning position: Universal								
CODE	WATTS	LENGTH	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
T218	18	2ft 600mm	23 White	1225	0.37	BF24	155/200	PFC04
T218C	18	2ft 600mm	20 Cool-white	1150	0.37	BF24	155/200	PFC04
T218WW	18	2ft 600mm	30 Warm-white	1200	0.37	BF24	155/200	PFC04
T436	36	4ft 1200mm	23 White	3050	0.43	BF40	155/500	PFC04
T436C	36	4ft 1200mm	20 Cool-white	3000	0.43	BF40	155/500	PFC04
T436WW	36	4ft 1200mm	30 Warm-white	3000	0.43	BF40	155/500	PFC04
T558	58	5ft 1500mm	23 White	5100	0.67	BF65	155/500	PFC06
T558C	58	5ft 1500mm	20 Cool-white	4800	0.67	BF65	155/500	PFC06
T558WW	58	5ft 1500mm	30 Warm-white	4800	0.67	BF65	155/500	PFC06
T670	70	6ft 1800mm	23 White	5500	0.70	BF75	155/600	PFC08
T670C	70	6ft 1800mm	20 Cool-white	5400	0.70	BF75	155/600	PFC08
T670WW	70	6ft 1800mm	30 Warm-white	5500	0.70	BF75	155/600	PFC08
T810*	100	8ft 2400mm	23 White	8200	1.00	BF100	155/800	PFC09
T810C*	100	8ft 2400mm	20 Cool-white	7800	1.00	BF100	155/800	PFC09
T810WW*	100	8ft 2400mm	30 Warm-white	7800	1.00	BF100	155/800	PFC09

* T12, 38mm diameter

See Technical Notes p. 50

EVERSUN UVA T12 Diameter: 38mm; Cap: G13; Burning position: Universal										
CODE	WATTS	LENGTH	TYPE	LAMP CURRENT A	EFFECTIVE LIFE h	UVA* RADIATION AT 100h W	SAFETY FACTOR[1]	% DEPRECIATION BASED ON 100h VALUE AT 1,000h[2]	ANGLE OF WINDOW	STARTER
UVA5B	80	5ft 1500mm	Blue	0.85	1,000	18	4	20	N/A	155/500
UVA5P	80	5ft 1500mm	Pink	0.85	1,000	17.5	4	21	N/A	155/500
UVA5R	80	5ft 1500mm	Blue refl.	0.85	1,000	†	4	20	165°	155/500
UVA5PR	80	5ft 1500mm	Pink refl.	0.85	1,000	†	4	21	165°	155/500
UVA5S	80	5ft 1500mm	Super	0.85	500	16	0.8	20	N/A	155/500
UVA6B	100	6ft 1800mm	Blue	1.00	1,000	23	4	22	N/A	155/600
UVA6P	100	6ft 1800mm	Pink	1.00	1,000	21.5	4	25	N/A	155/600
UVA6R	100	6ft 1800mm	Blue refl.	1.00	1,000	†	4	22	165°	155/600
UVA6PR	100	6ft 1800mm	Pink refl.	1.00	1,000	†	4	25	165°	155/600
UVA6S	100	6ft 1800mm	Super	1.00	500	18	0.8	20	N/A	155/600

* UVA is 315-400nm.

† The forward intensity of reflector lamps is the equivalent to 1.5 times the intensity of a non-reflector lamp of the same rating and type.

[1] Lamp safety factor according to DIN 5031 part 10. This is the ratio of the time of exposure required for erythermal reaction to occur compared with that for pigmentation.

[2] UVA5S and UVA6S are measured at 500h.

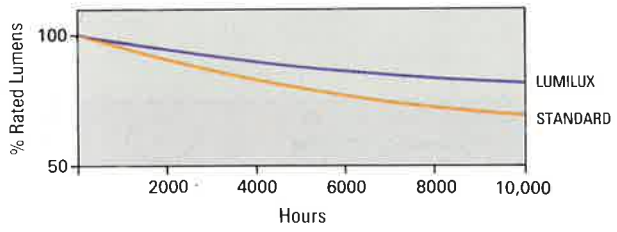
See Technical Notes p. 50

LUMILUX and LUMILUX DE LUXE TRIPHOSPHOR T8 KRYPTON-FILLED Diameter: 26mm Cap: G13 Burning position: Universal								
CODE	WATTS	LENGTH	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
T218T6	18	2ft 600mm	11 LUMILUX Daylight	1300	0.37	BF24	155/200	PFC04
T218D6	18	2ft 600mm	12 LUMILUX DE LUXE Daylight	1000	0.37	BF24	155/200	PFC04
T218T4	18	2ft 600mm	21 LUMILUX Cool-white	1450	0.37	BF24	155/200	PFC04
T218D4	18	2ft 600mm	22 LUMILUX DE LUXE Cool-white	1000	0.37	BF24	155/200	PFC04
T218T3	18	2ft 600mm	31 LUMILUX Warm-white	1450	0.37	BF24	155/200	PFC04
T218D3	18	2ft 600mm	32 LUMILUX DE LUXE Warm-white	1000	0.37	BF24	155/200	PFC04
T218T2	18	2ft 600mm	41 LUMILUX Warm	1450	0.37	BF24	155/200	PFC04
T436T6	36	4ft 1200mm	11 LUMILUX Daylight	3250	0.43	BF40	155/500	PFC04
T436D6	36	4ft 1200mm	12 LUMILUX DE LUXE Daylight	2350	0.43	BF40	155/500	PFC04
T436T4	36	4ft 1200mm	21 LUMILUX Cool-white	3450	0.43	BF40	155/500	PFC04
T436D4	36	4ft 1200mm	22 LUMILUX DE LUXE Cool-white	2350	0.43	BF40	155/500	PFC04
T436T3	36	4ft 1200mm	31 LUMILUX Warm-white	3450	0.43	BF40	155/500	PFC04
T436D3	36	4ft 1200mm	32 LUMILUX DE LUXE Warm-white	2350	0.43	BF40	155/500	PFC04
T436T2	36	4ft 1200mm	41 LUMILUX Warm	3450	0.43	BF40	155/500	PFC04
T558T6	58	5ft 1500mm	11 LUMILUX Daylight	5200	0.67	BF65	155/500	PFC06
T552D6	58	5ft 1500mm	12 LUMILUX DE LUXE Daylight	3750	0.67	BF65	155/500	PFC06
T558T4	58	5ft 1500mm	21 LUMILUX Cool-white	5400	0.67	BF65	155/500	PFC06
T558D4	58	5ft 1500mm	22 LUMILUX DE LUXE Cool-white	3750	0.67	BF65	155/500	PFC06
T558T3	58	5ft 1500mm	31 LUMILUX Warm-white	5400	0.67	BF65	155/500	PFC06
T558D3	58	5ft 1500mm	32 LUMILUX DE LUXE Warm-white	3750	0.67	BF65	155/500	PFC06
T558T2	58	5ft 1500mm	41 LUMILUX Warm	5400	0.67	BF65	155/500	PFC06
T670T4	70	6ft 1800mm	21 LUMILUX Cool-white	6550	0.70	BF75	155/600	PFC08
T670T3	70	6ft 1800mm	31 LUMILUX Warm-white	6550	0.70	BF75	155/600	PFC08
T810T4*	100	8ft 2400mm	21 LUMILUX Cool-white	9400	1.00	BF100	155/800	PFC09
T810T3*	100	8ft 2400mm	31 LUMILUX Warm-white	9400	1.00	BF100	155/800	PFC09

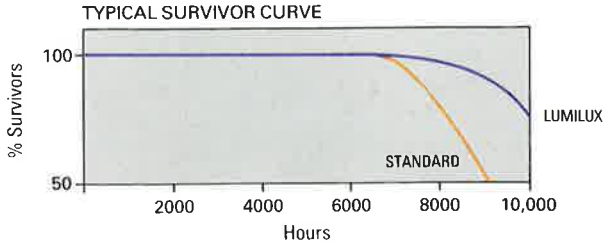
* T12, 38mm diameter

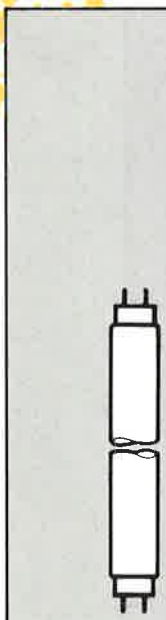
See Technical Notes p. 50

TYPICAL LUMEN MAINTENANCE



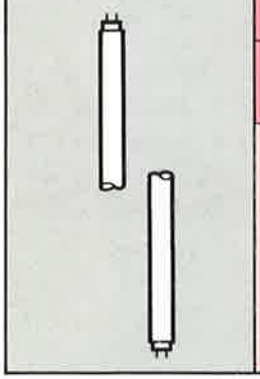
TYPICAL SURVIVOR CURVE





SPECIAL T12 HALOPHOSPHATE, ARGON-FILLED Diameter: 38mm Cap: G13 Burning position: Universal								
CODE	WATTS	LENGTH	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
T220N	20	2ft 600mm	Natural	910	0.37	BF24	155/200	PFC04
T220DW	20	2ft 600mm	De luxe warm-white	950	0.37	BF24	155/200	PFC04
T440N	40	4ft 1200mm	Natural	2300	0.43	BF40	155/500	PFC04
T440CM	40	4ft 1200mm	Colour-matching	2100	0.43	BF40	155/500	PFC04
T440DW	40	4ft 1200mm	De luxe warm-white	2200	0.43	BF40	155/500	PFC04
T440DN	40	4ft 1200mm	De luxe natural	1600	0.43	BF40	155/500	PFC04
T565N	65	5ft 1500mm	Natural	3700	0.67	BF65	155/500	PFC06
	80			4300	0.87	–	155/500	–
T565CM	65	5ft 1500mm	Colour-matching	3500	0.67	BF65	155/500	PFC06
	80			4000	0.87	–	155/500	–
T565DW	65	5ft 1500mm	De luxe warm-white	3600	0.67	BF65	155/500	PFC06
	80			4100	0.87	–	155/500	–
T565DN	65	5ft 1500mm	De luxe natural	2600	0.67	BF65	155/500	PFC06
	80			3200	0.87	–	155/500	–
T675N	75	6ft 1800mm	Natural	4400	0.64	BF75	155/600	PFC08
	85			4800	0.80	–	155/600	–
T675CM	75	6ft 1800mm	Colour-matching	4000	0.64	BF75	155/600	PFC08
	85			4370	0.80	–	155/600	–
T675DN	75	6ft 1800mm	De luxe natural	3100	0.64	BF75	155/600	PFC08
	85			3500	0.80	–	155/600	–
T885N	85	8ft 2400mm	Natural	5000	0.55	–	–	–
T885DN	85	8ft 2400mm	De luxe natural	4300	0.55	–	–	–
T812N	125	8ft 2400mm	Natural	7150	0.94	BF125	EFS600	PFC07244
T812CM	125	8ft 2400mm	Colour-matching	6650	0.94	BF125	EFS600	PFC07244
T812DN	125	8ft 2400mm	De luxe natural	5000	0.94	BF125	EFS600	PFC07244

See Technical Notes p. 50



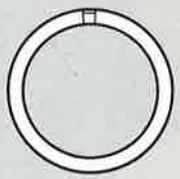
STANDARD T5 HALOPHOSPHATE Diameter: 15mm Cap: G5 Burning position: Universal								
CODE	WATTS	LENGTH	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
T64	4	6in 150mm	23 White	130	0.17	–	155/100	–
T96	6	9in 225mm	23 White	300	0.16	–	155/100	–
T96WW	6	9in 225mm	30 Warm-white	295	0.16	–	155/100	–
T96C	6	9in 225mm	20 Cool-white	280	0.16	–	155/100	–
T128	8	12in 300mm	23 White	480	0.145	BF08	155/100	–
T128WW	8	12in 300mm	30 Warm-white	480	0.145	BF08	155/100	–
T128C	8	12in 300mm	20 Cool-white	400	0.145	BF08	155/100	–
T2113	13	21in 525mm	23 White	860	0.165	–	155/100	–
T2113W	13	21in 525mm	30 Warm-white	875	0.165	–	155/100	–
T2113C	13	21in 525mm	20 Cool-white	820	0.165	–	155/100	–

See Technical Notes p. 50

STANDARD T12 HALOPHOSPHATE, ARGON-FILLED Diameter: 38mm Cap: G13 Burning position: Universal								
CODE	WATTS	LENGTH	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
T220	20	2ft 600mm	23 White	1225	0.37	BF24	155/200	PFC04
T220C	20	2ft 600mm	20 Cool-white	1170	0.37	BF24	155/200	PFC04
T220WW	20	2ft 600mm	30 Warm-white	1200	0.37	BF24	155/200	PFC04
T240	40	2ft 600mm	23 White	2050	0.88	BF40	155/500	PFC04
T240C	40	2ft 600mm	20 Cool-white	2100	0.88	BF40	155/500	PFC04
T240WW	40	2ft 600mm	30 Warm-white	2000	0.88	BF40	155/500	PFC04
T440	40	4ft 1200mm	23 White	3050	0.43	BF40	155/500	PFC04
T440C	40	4ft 1200mm	20 Cool-white	2950	0.43	BF40	155/500	PFC04
T440WW	40	4ft 1200mm	30 Warm-white	3050	0.43	BF40	155/500	PFC04
T565	65	5ft 1500mm	23 White	5000	0.67	BF65	155/500	PFC06
	80			5750	0.87	–	155/500	–
T565C	65	5ft 1500mm	20 Cool-white	4800	0.67	BF65	155/500	PFC06
	80			5500	0.87	–	155/500	–
T565WW	65	5ft 1500mm	30 Warm-white	4950	0.67	BF65	155/500	PFC06
	80			5600	0.87	–	155/500	–
T675	75	6ft 1800mm	23 White	6050	0.64	BF75	155/600	PFC08
	85			6550	0.80	–	155/600	–
T675C	75	6ft 1800mm	20 Cool-white	5750	0.64	BF75	155/600	PFC08
	85			6250	0.80	–	155/600	–
T675WW	75	6ft 1800mm	30 Warm-white	5950	0.64	BF75	155/600	PFC08
	85			6500	0.80	–	155/600	–
T885	85	8ft 2400mm	23 White	6900	0.55	–	–	–
T885C	85	8ft 2400mm	20 Cool-white	7000	0.55	–	–	–
T885WW	85	8ft 2400mm	30 Warm-white	6700	0.55	–	–	–
T812	125	8ft 2400mm	23 White	9500	0.94	BF125	EFS600	PFC07244
T812C	125	8ft 2400mm	20 Cool-white	9300	0.94	BF125	EFS600	PFC07244
T812WW	125	8ft 2400mm	30 Warm-white	9200	0.94	BF125	EFS600	PFC07244

See Technical Notes p. 50

CIRCULAR T10 HALOPHOSPHATE Diameter: 32mm Cap: G10q Burning position: Universal								
CODE	WATTS	NOMINAL DIAMETER	COLOUR APPEARANCE	RATED LUMENS	LAMP CURRENT A	BALLAST	STARTER	CAPACITOR
CIR32	32	12in 300mm	Warm-white	1850	0.45	–	155/500	–
CIR40	40	16in 400mm	Warm-white	2350	0.42	BF40	155/500	–
CIR60	60	16in 400mm	Warm-white	3400	0.45	–	155/500	–



See Technical Notes p. 50

M E T A L

P O W E R S

The introduction of rare-earth metals and halides into mercury discharge lamps has led to a dramatic improvement in both colour performance and luminous efficacy and has greatly extended their range of applications.

Early metal halide lamps were limited to higher wattages and a colour temperature over 5000K (daylight). Subsequent development by OSRAM has since provided a wide range of wattages and colour performance suitable for both industrial and commercial environments. The warmer colour temperatures have been specifically developed to blend with other light sources, such as tungsten and fluorescent.

OSRAM POWER STAR HQI lamps offer four colour appearances and a range of wattages to suit any environment, from display lighting to high-bay applications.

POWER STAR HQI-T

These are single-ended lamps in a clear envelope that give high lumen efficacy and a good colour performance.

The HQI-T compact lamp with bi-pin base is available in 35, 70 and 150 watt ratings, and has a Warm-white de luxe colour appearance. It is specifically designed for architectural and display applications.

The standard HQI-T tubular lamp with E40 base is available in ratings from 250 to 3500 watts, and is ideal for commercial, industrial and external floodlighting applications.

Blue and green HQI-T lamps are also available for special-effect floodlighting.

HQI-T

COLOUR APPEARANCE		NOMINAL CORRELATED COLOUR TEMPERATURE
DAYLIGHT	(D)	5000-6000K
NEUTRAL WHITE	(N)	4500K
NEUTRAL WHITE DELUXE	(NDL)	4200K
WARM WHITE DELUXE	(WDL)	3000K

H·A·L·I·D·E

STAR HQI

HQI-TS

HQI-T

POWER STAR HQI-E

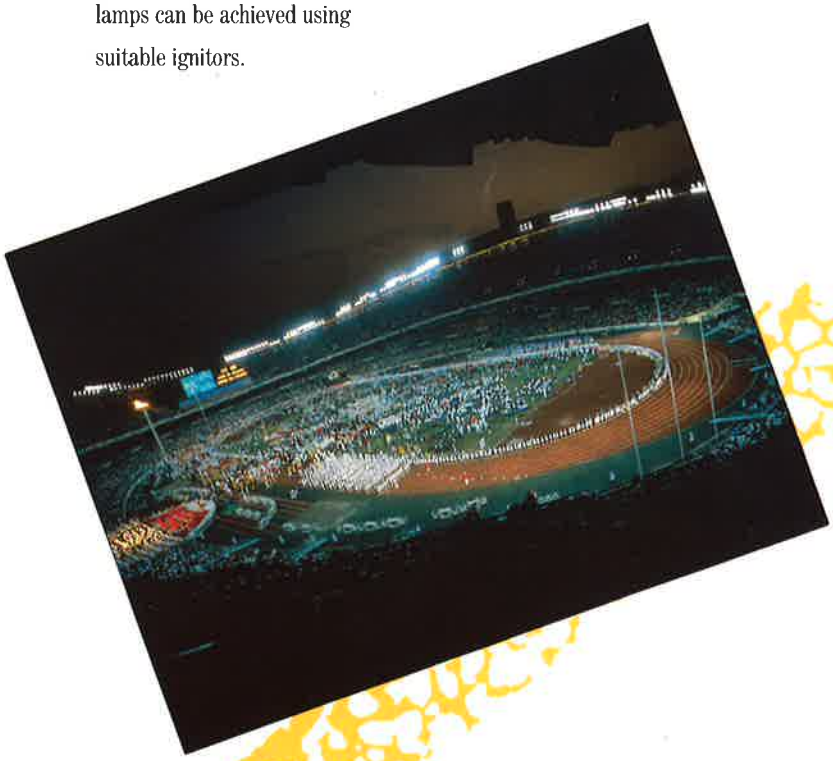
These are single-ended lamps in an elliptical envelope which have a diffusing coating to reduce glare and offer improved comfort in general lighting applications.

HQI-TS

These lamps are double-ended and in 70W and 150W compact form are ideally suited to display lighting applications.

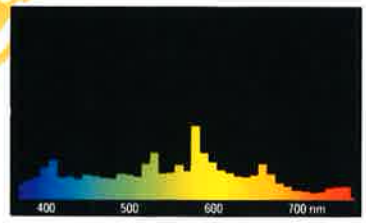
The slim profile of standard HQI-TS lamps makes them suitable for applications from commercial uplighting to sports stadia floodlighting.

Instant hot re-strike of HQI-TS lamps can be achieved using suitable ignitors.

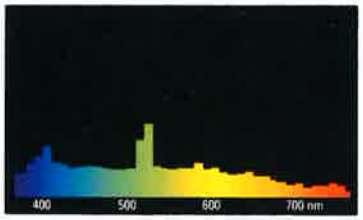


M·E·T·A·L

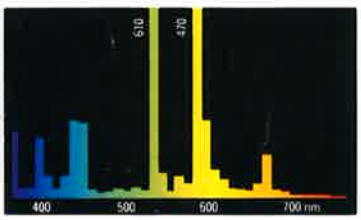
P O W E R S T A



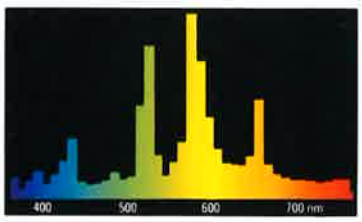
HQI/NDL



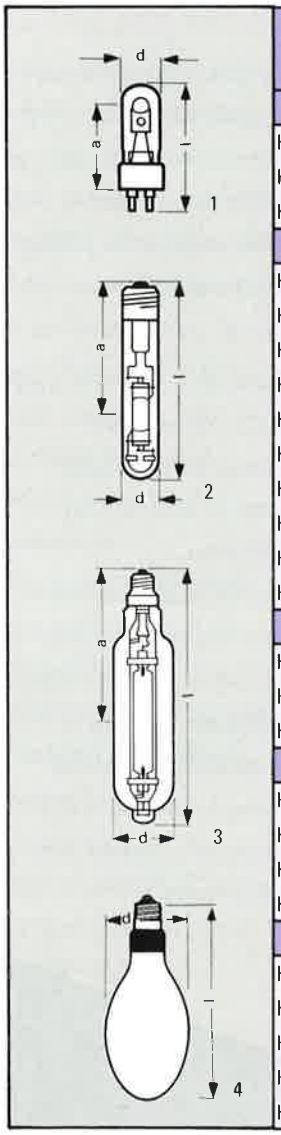
HQI/D



HQI/N



HQI/WDL



CODE	WATTS	VOLTS	COLOUR APPEAR-ANCE	RATED LUMENS	DIMENSIONS mm			DIAG NO.
					a	d	l	
H35W	39	220/240	WDL	2400	56	25	84	1
H70W	75	220/240	WDL	5200	56	25	84	1
H150W	150	220/240	WDL	12000	56	25	84	1
H250D	250	220/240	D	19000	150	46	220	2
H400HD	360	220/240	D	25000	175	46	285	2
H400VD	360	220/240	D	28000	175	46	285	2
H400D	400	220/240	D	33000	175	46	285	2
H400B	400	220/240	BLUE	8000	177	66	285	2
H400G	500	220/240	GREEN	20000	177	66	285	2
H1KWD	1000	220/240	D	80000	205	76	340	3
H2KWN	2000	380/440	N	190000*	265	100	430	3
H2KWNI	2000	380/440	N	190000*	265	100	430	3
H35KWD	3500	380/440	D	300000	265	100	430	3
H250ED	250	220/240	D	17000	N/A	90	226	4
H400ED	400	220/240	D	31000	N/A	120	290	4
H1KWEN	1000	220/240	N	80000	N/A	165	380	4
								HQI
H70SND	73	220/240	NDL	5500	57	20	114.2	5
H70SW	75	220/240	WDL	5000	57	20	114.2	5
H15SND	150	220/240	NDL	11250	66	23	132	5
H150SW	150	220/240	WDL	11000	66	23	132	5
H25SND	250	220/240	NDL	20000	81	25	163	6
H250SD	250	220/240	D	19000	81	25	163	6
H400SD	360	220/240	D	25500	103	31	206	6
H1KSD	1000	220/240	D	90000	130	36	260	6
H2KSD	2000	380/440	D	200000	83	36	187	7

* 170000 in horizontal position.

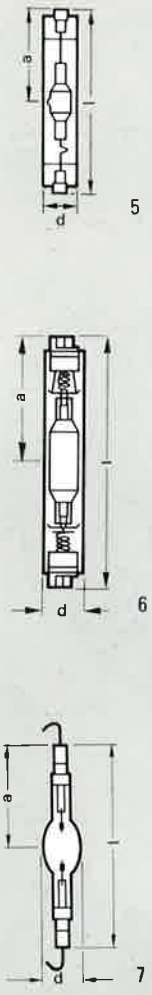
† Ignitors must **not** be used.

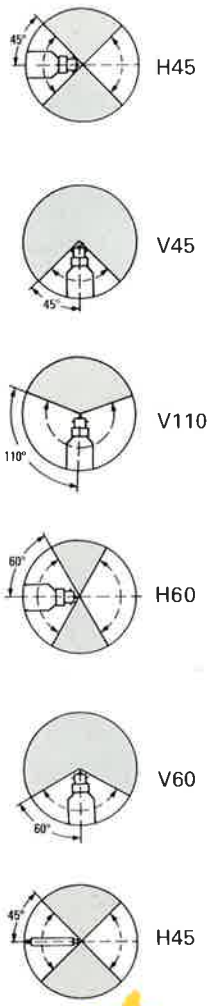
For further technical information, please refer to POWER STAR HQI literature.

H·A·L·I·D·E

R HQI DATA

LAMP CURRENT (A)	Ra INDEX GROUP	BURNING POSITION	BASE/ CAP	BALLAST	IGNITOR	CAPACITOR
HQI-T COMPACT						
0.5	80-89	U	G12	BH35	IS05	PFC06S
1.0	80-89	U	G12	BSH70	ISH18	PFC10S
1.8	80-89	U	G12	BSH150	ISH4	PFC20S
HQI-T TUBULAR						
3.0	90-100	U	E40	BSH250	ISH4	PFC30S
3.5	90-100	H45	E40	BHR400	ISH4	PFC35S
3.5	90-100	V45	E40	BHR400	ISH4	PFC35S
4.0	90-100	U	E40	BSH400	ISH4	PFC35S
3.6	N/A	V110	E40	BHR400	STABILISER ISC4	PFC30S
3.6	N/A	V110	E40	BHR400	STABILISER ISC4	PFC30S
9.5	90-100	H60	E40	BHR1000L	ISH61L	PFC50S & PFC35S
8.8	60-69	U	E40	BHR2000H	ISHR612H	2 x PFC2044S
8.8	60-69	U	E40	BHR2000H	N/A†	2 x PFC2044S
18.0	90-100	V60	E40	3 x BHR3500H	ISHR635H	2 x PFC50S
HQI-E ELLIPTICAL						
3.0	90-100	U	E40	BSH250	ISH4	PFC30S
4.0	90-100	U	E40	BSH400	ISH4	PFC45S
9.5	60-69	V45	E40	BHR1000L	ISH61L	PFC50S & PFC35S
TS DOUBLE-ENDED COMPACT						
1.0	80-89	H45	R7s	BSH70	ISH18	PFC10S
1.0	80-89	H45	R7s	BSH70	ISH18	PFC10S
1.8	80-89	H45	R7s	BSH150	ISH18	PFC20S
1.8	80-89	H45	R7s	BSH150	ISH18	PFC20S
HQI-TS DOUBLE-ENDED						
3.0	80-89	H45	FC2	BSH250	ISH4	PFC30S
3.0	90-100	H45	FC2	BSH250	ISH4	PFC30S
3.5	90-100	H45	FC2	BHR400	ISH4	PFC35S
9.5	90-100	H45	FC2	BHR1000L	ISH61L	PFC50S & PFC35S
10.3	90-100	U	Leads	BHR2000TS	ISHR612H	3 x PFC2044S





See Technical Notes p. 50

H·I·G·H P·R
M·E·R·

M

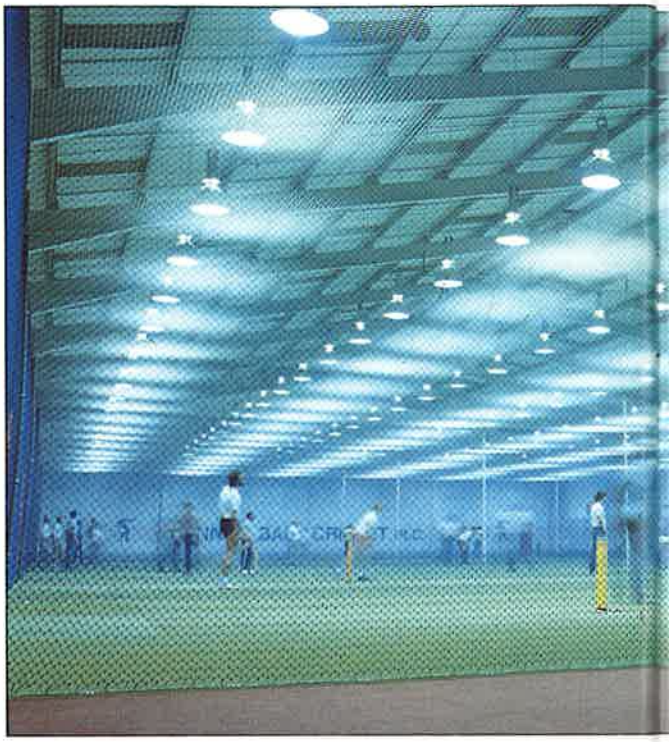
First introduced in 1932, the high pressure mercury lamp has been developed into an extensive range with TRUELITE phosphor-coating offering improved colour performance.

MBF/U

This elliptical lamp offers a wide choice for both indoor and outdoor applications with a range from 50W to 1000W.

MBFR/U

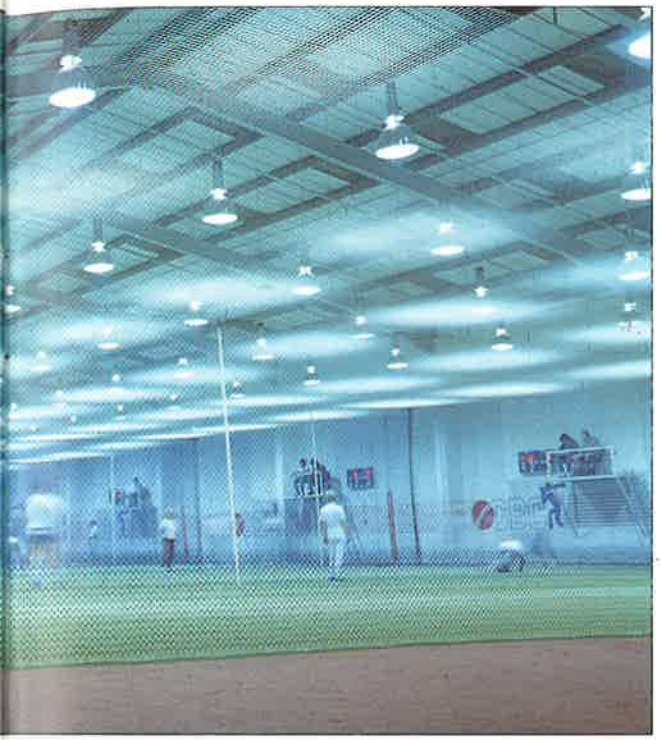
An integral reflector makes this lamp ideal for industrial high-bay installations. The smaller 125W is also suitable for use in downlights in commercial environments.



TYPE	NOMINAL CORRELATED COLOUR TEMPERATURE
MBF	4000K
MBFR	3800K
MBFT	4400K

E S S U R E
C U R Y

B F



MBFT/V

This blended lamp has an internal tungsten filament and requires no external control gear. It can therefore be a direct replacement for high-wattage incandescent lamps.

MBW/U AND MBWT/V

The long-wave ultra-violet radiation of 365 nanometers emitted by these lamps makes them ideal for special applications such as security identification or theatrical effects. The MBWT/V requires no external control gear.

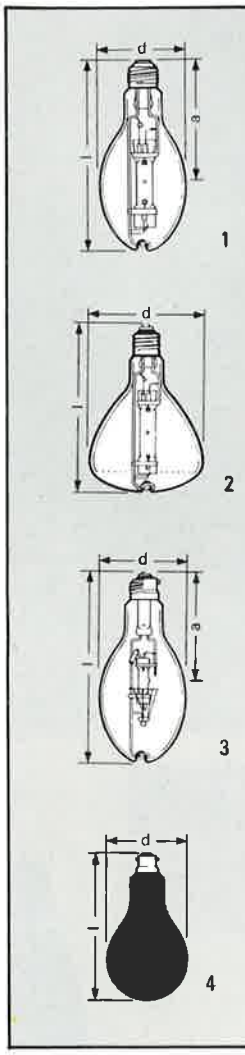
MBW

MBF/U

MBFR/U

H·I·G·H P·R
M·E·R·

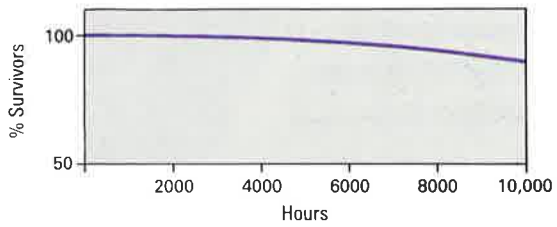
M B F



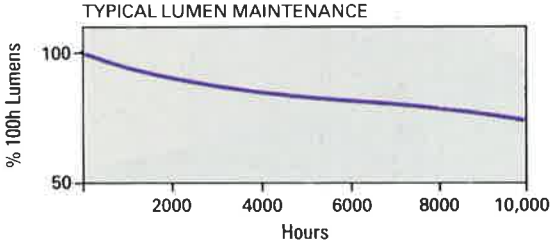
CODE	WATTS	VOLTS	RATED LUMENS
MB50	50	220/240	1900
MB80	80	220/240	3800
MB803	80	220/240	3800
MB125	125	220/240	6200
MB125G	125	220/240	6200
MB1253	125	220/240	6200
MB250	250	220/240	13000
MB400	400	220/240	22700
MB700	700	220/240	39000
MB1KLV	1000	220/240	56000
MB1KHV	1000	380/440	58000
MR125	125	220/240	5000
MR250	250	220/240	12000
MR400	400	220/240	20000
MR700	700	220/240	34000
MR1KLV	1000	220/240	53000
MR1KHV	1000	380/440	53000
MBFT	160	240/240	2800
MBFTE	160	240/240	2800
MBFT25	250	240/240	4700
MBW3	125	220/240	N/A
MBWE	125	220/240	N/A
MBWT	175	220/240	N/A
MBWTE	175	220/240	N/A

See Technical Notes p. 50.

TYPICAL SURVIVOR CURVE



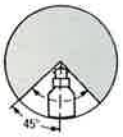
TYPICAL LUMEN MAINTENANCE



MERCURY

DATA

DIMENSIONS mm			DIAG. NO.	LAMP CURRENT (A)	Ra INDEX GROUP	BURNING POSITION	BASE/ CAP	BALLAST	CAPACITOR
a	d	l							
MBF/U									
89	56	129	1	0.6	40-59	U	E27	BM50	PFC06S
103	71	165	1	0.8	40-59	U	E27	BM80	PFC08S
103	71	165	1	0.8	40-59	U	B22d-3	BM80	PFC08S
112	76	178	1	1.15	40-59	U	E27	BM125	PFC10S
112	76	178	1	1.15	40-59	U	E40	BM125	PFC10S
112	76	178	1	1.15	40-59	U	B22d-3	BM125	PFC10S
150	91	227	1	2.15	40-59	U	E40	BM250	PFC15S
177	121	285	1	3.25	40-59	U	E40	BM400	PFC20S
208	143	322	1	5.45	40-59	U	E40	BM700	PFC30S
261	167	400	1	7.75	40-59	U	E40	BM1000L	PFC50S
212	167	350	1	3.6	40-59	U	E40	BM1000H	PFC1544S
MBFR/U									
N/A	127	178	2	1.15	40-59	U	E27	BM125	PFC10S
N/A	168	250	2	2.15	40-59	U	E40	BM250	PFC15S
N/A	179	275	2	3.25	40-59	U	E40	BM400	PFC20S
N/A	203	312	2	5.45	40-59	U	E40	BM700	PFC30S
N/A	220	357	2	7.75	40-59	U	E40	BM1000L	PFC50S
N/A	220	357	2	3.6	40-59	U	E40	BM1000H	PFC1544S
MBFT/V									
130	76	178	3	0.65	40-59	V45	B22d	N/A	N/A
130	76	178	3	0.65	40-59	V45	E27	N/A	N/A
150	91	227	3	1.05	40-59	V45	E40	N/A	N/A
MBW/U, MBWT/V									
N/A	89	180	4	1.15	N/A	U	B22d-3	BM125	PFC10S
N/A	89	180	4	1.15	N/A	U	E27	BM125	PFC10S
N/A	89	180	4	0.77	N/A	V45	B22d	N/A	N/A
N/A	89	180	4	0.77	N/A	V45	E27	N/A	N/A



V45

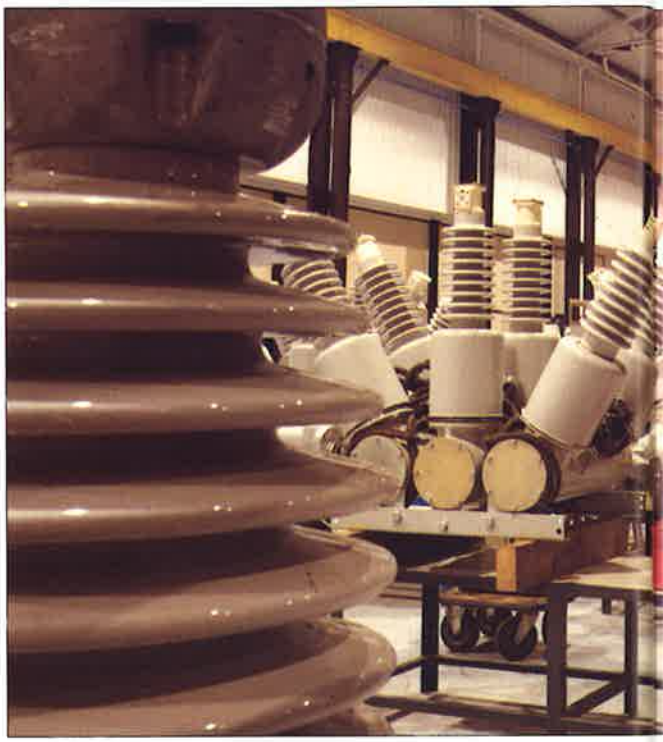
H·I·G·H P·R
S·O·D

S O

OSRAM first introduced the SON high pressure sodium lamp in 1966, and continuous development in performance has led to it being the most widely-used High Intensity Discharge (HID) lamp for both interior and external applications.

The extensive SON range encompasses versions for most environments, with ratings from 50 to 1000 watts and luminous efficacies up to 150 lm/W.

Three principal SON lamp types have been developed by OSRAM and are currently available.



STANDARD SON

This lamp provides a high light output which has a warm, golden-white appearance at a nominal correlated colour temperature of 2100K. The range includes clear tubular, elliptical diffuse, reflector and double-ended clear linear.

With the exception of the double-ended version, they can be supplied with or without internal starter.

SON-TS

SON-T

TYPE	NOMINAL CORRELATED COLOUR TEMPERATURE
STANDARD	2100K
PLUS	1900K
DELUXE	2200K

SON-R

SON ELLIPTICAL

E S S U R E
I U M

N

SON Plus

An increase in lumen output of between 10% and 20% over the standard lamp is offered by SON Plus, which allows for the use of fewer luminaires. In addition, the Plus lamp has a better lumen maintenance than the standard lamp – after 10,000 hours burning, Plus lamps still provide 97% of their initial output.

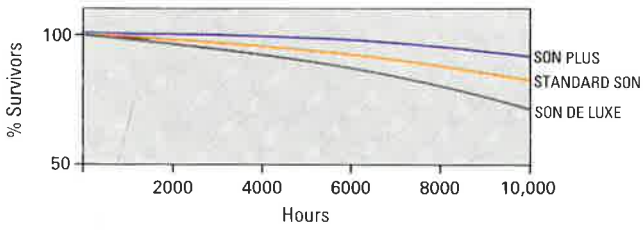
SON Plus is available in clear tubular and elliptical diffuse forms. Both require a suitable external ignitor in circuit.

SON De luxe

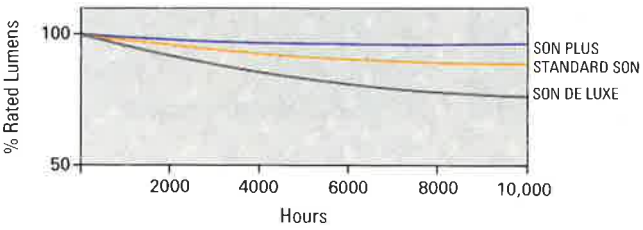
Specifically designed for use in applications requiring improved colour rendering. The additional red and blue content provides a light source which is warm in appearance but achieves a nominal Ra Index of up to 65: this has led to their widespread use in commercial interiors.

The De luxe lamp is available in clear tubular and elliptical forms.

TYPICAL SURVIVOR CURVE

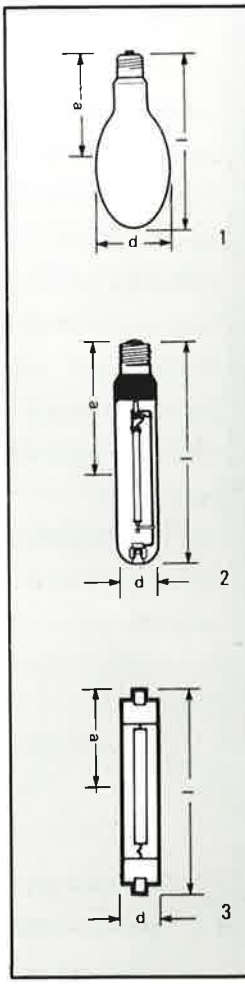


TYPICAL LUMEN MAINTENANCE



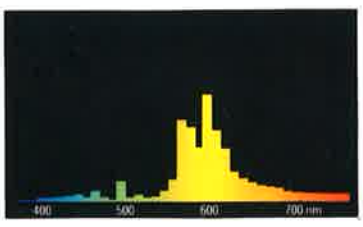
H·I·G·H P·R
S·O·D

S O N

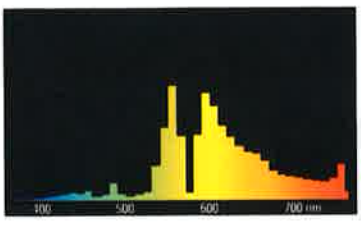


CODE	WATTS	VOLTS	RATED LUMENS	DIMENSIONS mm			DIAG. NO.
				a	d	l	
SON PLUS							
S150P	150	220/240	16500	150	91	227	1
S250P	250	220/240	31500	150	91	227	1
S310P	310	220/240	39500	175	121	285	1
S400P	400	220/240	55000	175	121	285	1
SON PLUS T							
S150PT	150	220/240	17500	130	52	211	2
S250PT	250	220/240	33000	158	52	257	2
S310PT	310	220/240	41000	175	52	285	2
S400PT	400	220/240	56500	175	52	285	2
S600PT	600	220/240	92000	175	52	285	2
SON							
S70TS	70	220/240	7000	57	20	114.2	3
S15TS	150	220/240	15000	66	20	132	3
SON DE LUXE							
S150DL	150	220/240	11500	150	91	227	1
S250DL	250	220/240	21750	150	91	227	1
S400DL	400	220/240	37000	175	121	285	1
SON DE LUXE							
S250DI	250	220/240	21750	150	91	227	1
SON DE LUXE T							
S150DT	150	220/240	12000	130	52	211	2
S250DT	250	220/240	21750	158	52	257	2
S400DT	400	220/240	37000	175	52	285	2
SON DE LUXE T							
S25DTI	250	220/240	21750	158	52	257	2

See Technical Notes p. 50



SON PLUS

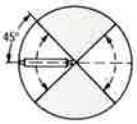


SON DE LUXE

E S S U R E
I U M

D A T A

LAMP CURRENT (A)	Ra INDEX GROUP	BURNING POSITION	BASE/ CAP	BALLAST	IGNITOR	CAPACITOR
ELLIPTICAL DIFFUSE External ignitor (E)						
1.8	20-39	U	E40	BSH150	ISH4	PFC20S
3.0	20-39	U	E40	BSH250	ISH4	PFC30S
3.4	20-39	U	E40	†	†	†
4.45	20-39	U	E40	BSH400	ISH4	PFC40S
TUBULAR CLEAR External ignitor (E)						
1.8	20-39	U	E40	BSH150	ISH4	PFC20S
3.0	20-39	U	E40	BSH250	ISH4	PFC30S
3.4	20-39	U	E40	†	†	†
4.45	20-39	U	E40	BSH400	ISH4	PFC40S
6.2	20-39	U	E40	BSR600L	ISR6L	2 x PFC30S
LINEAR CLEAR External ignitor (E)						
1.0	20-39	H45	R7s	BSH70	ISH18	PFC10S
1.8	20-39	H45	R7s	BSH150	ISH4	PFC20S
ELLIPTICAL DIFFUSE External ignitor (E)						
1.8	60-69	U	E40	BSH150	ISH4	PFC20S
3.0	60-69	U	E40	BSH250	ISH4	PFC40S
4.45	60-69	U	E40	BSH400	ISH4	PFC40S
ELLIPTICAL DIFFUSE Internal starter (I)						
3.0	60-69	U	E40	BSH250	N/A	PFC30S
TUBULAR CLEAR External ignitor (E)						
1.8	60-69	U	E40	BSH150	ISH4	PFC20S
3.0	60-69	U	E40	BSH250	ISH4	PFC30S
4.45	60-69	U	E40	BSH400	ISH4	PFC40S
TUBULAR CLEAR Internal starter (I)						
3.0	60-69	U	E40	BSH250	N/A	PFC30S



H45

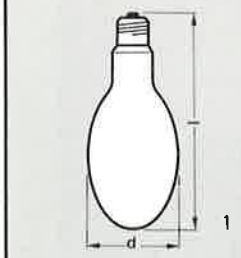
† Lamp for replacement only.

N.B. Lamps of 120W or more with internal starters are not suitable for use on circuits with superimposed pulse ignitors.

BSH ballasts are suitable replacements for BS and BSR ballasts.

H·I·G·H P·R
S·O·D

S O N



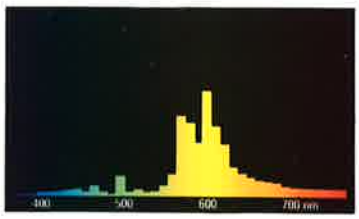
CODE	WATTS	VOLTS	RATED LUMENS	DIMENSIONS mm			DIAG. NO.
				a	d	l	
STANDARD SON							
S50	50	220/240	3500	100	72	157	1
S70I	70	220/240	5800	100	72	157	1
S120	120	220/240	10500	112	76	178	1
S150I	150	220/240	15250	150	91	227	1
S220	220	220/240	23000	150	91	227	1
S250I	250	220/240	27000	150	91	227	1
S310	310	220/240	36000	175	121	285	1
S310	360	220/240	42000	175	121	285	1
S400I	400	220/240	48500	175	121	285	1
STANDARD SON							
S70	70	220/240	6800	100	72	157	1
S150	150	220/240	15250	150	91	227	1
S250	250	220/240	27000	150	91	227	1
S400	400	220/240	48500	175	91	285	1
STANDARD SON-T							
S150TI	150	220/240	16000	130	52	211	2
S220T	220	220/240	24000	158	52	257	2
S250TI	250	220/240	28000	158	52	257	2
S310T	310	220/240	37000	175	52	285	2
S310T	360	240	43500	175	52	285	2
S400TI	400	220/240	50000	175	52	285	2
S600TI	600	380/440	70000	200	67	328	2
S1KWTI	1000	380/440	135000	240	67	400	2
STANDARD SON-T							
S50T	50	220/240	4000	104	37	156	2
S70T	70	220/240	6500	104	37	156	2
S100T	100	220/240	10000	132	46	211	2
S150T	150	220/240	16000	130	52	211	2
S250T	250	220/240	28000	158	52	257	2
S400T	400	220/240	50000	175	52	285	2
S600T	600	220/240	74000	200	67	328	2
S1KWT	1000	220/240	132000	240	67	400	2
STANDARD SON-R							
S250R	250	220/240	23000	N/A	167	260	3
S310R	310	220/240	31500	N/A	167	260	3
S360R	360	220/240	37000	N/A	167	260	3
S400R	400	220/240	42500	N/A	167	260	3
STANDARD SON-TS							
S250TS	250	220/240	28000	N/A	20	273	4
S400TS	400	220/240	50000	N/A	20	273	4

See Technical Notes p. 50

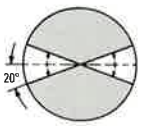
E S S U R E
I U M

D A T A

LAMP CURRENT (A)	Ra INDEX GROUP	BURNING POSITION	BASE/ CAP	BALLAST	IGNITOR	CAPACITOR
ELLIPTICAL DIFFUSE Internal starter ⚠1						
0.76	20-39	U	E27	BSR50	N/A	PFC08S
1.0	20-39	U	E27	BSH70	N/A	PFC10S
1.4	20-39	U	E27	†	N/A	†
1.8	20-39	U	E40	BSH150	N/A	PFC20S
2.5	20-39	U	E40	†	N/A	†
3.0	20-39	U	E40	BSH250	N/A	PFC30S
3.4	20-39	U	E40	†	N/A	†
3.7	20-39	U	E40	†	N/A	†
4.45	20-39	U	E40	BSH400	N/A	PFC40S
ELLIPTICAL DIFFUSE External ignitor ⚠E						
0.76	20-39	U	E27	BSH70	IS2	PFC10S
1.8	20-39	U	E40	BSH150	ISH4	PFC20S
3.0	20-39	U	E40	BSH250	ISH4	PFC30S
4.45	20-39	U	E40	BSH400	ISH4	PFC40S
TUBULAR CLEAR Internal starter ⚠1						
1.8	20-39	U	E40	BSH150	N/A	PFC20S
2.5	20-39	U	E40	†	N/A	†
3.0	20-39	U	E40	BSH250	N/A	PFC30S
3.4	20-39	U	E40	†	N/A	†
3.7	20-39	U	E40	†	N/A	†
4.45	20-39	U	E40	BSH400	N/A	PFC40S
3.7	20-39	U	E40	BSR600H	N/A	PFC2044S
5.7	20-39	U	E40	BSR1000H	N/A	2 x PFC1544S
TUBULAR CLEAR External ignitor ⚠E						
0.76	20-39	U	E27	BSR50	IS2	PFC08S
1.0	20-39	U	E27	BSH70	IS2	PFC10S
1.2	20-39	U	E40	BSH100	ISH18	PFC12S
1.8	20-39	U	E40	BSH150	ISH4	PFC20S
3.0	20-39	U	E40	BSH250	ISH4	PFC30S
4.45	20-39	U	E40	BSH400	ISH4	PFC40S
6.2	20-39	U	E40	BSR600L	ISR6L	2 x PFC30S
10.3	20-39	U	E40	BSR1000L	ISR1000L	2 x PFC50S
REFLECTOR Internal starter ⚠1						
3.0	20-39	U	E40	BSH250	N/A	PFC30S
3.4	20-39	U	E40	†	N/A	†
3.7	20-39	U	E40	†	N/A	†
4.45	20-39	U	E40	BSH400	N/A	PFC40S
LINEAR CLEAR External ignitor ⚠E						
3.0	20-39	H20	R12.5s	BSH250	ISH4	PFC30S
4.45	20-39	H20	R12.5s	BSH400	ISH4	PFC40S



SON



H20

† Lamp for replacement only.

N.B. Lamps of 120W or more with internal starters are not suitable for use on circuits with superimposed pulse ignitors.

BSH ballasts are suitable replacements for **BS** and BSR ballasts.

L·O·W P·R·E·S·S·

S

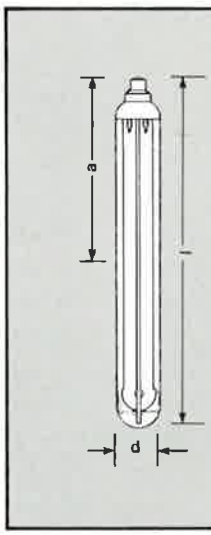
SOX lamps remain the most efficient light source commercially available. They generate a single wavelength of light at 589 nanometers which lies close to the 555 nanometers at which the human eye response is optimum.

Having a monochromatic output, the SOX lamp is best suited to exterior applications where colour rendering is not significant and efficacy is the key factor.

OSRAM low pressure sodium lamps are currently available in two forms: SUPER SOX and the more-recently-introduced SOX Economy (SOX-E).

SUPER SOX lamps incorporate a graduated layer of indium on the outer envelope which maintains a constant discharge temperature. This allows the use of a single sodium reservoir, resulting in increased lumen output and reduced lumen depreciation. Improvements to the indium film, combined with a modified arc-tube design in the SOX-E lamp, provide increased efficacy over SUPER SOX. The two forms of lamp are interchangeable when used on standard SOX ballasts.

SOX E/SUPER SOX EQUIVALENTS					
SUPER SOX (WATTS)	35	55	90	135	180
SOX-E (WATTS)	26	36	66	91	131

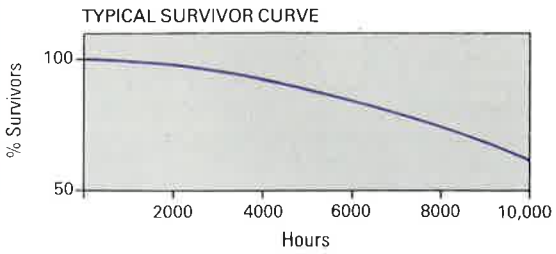


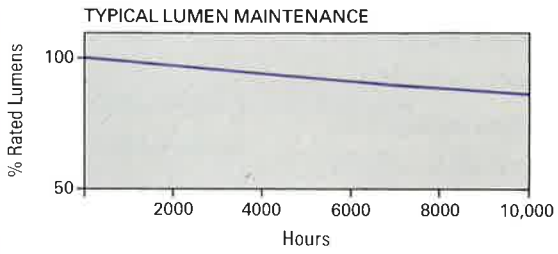
CODE	WATTS
SX18	18
SX35	35
SX55	55
SX90	90
SX135	135
SX180	180
SXE26	26
SXE36	36
SXE66	66
SXE91	91
SXE131	131

See Technical Notes p. 50

U·R·E S·O·D·I·U·M

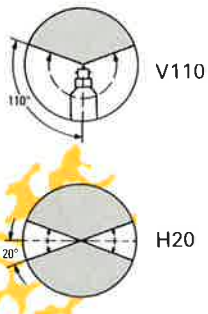
o x





VOLTS	RATED LUMENS	DIMENSIONS			LAMP CURRENT (A)	Ra INDEX GROUP	BURNING POSITION	BASE/ CAP	240V CONTROL GEAR		
		l	d	a					BALLAST	IGNITOR	CAPACITOR
SUPER SOX											
220/240	1800	216	54	130	0.35	N/A	V110	BY22d	BZSX18	ISX18	PFC04S
220/240	4600	311	54	180	0.60	N/A	V110	BY22d	BZSX35	ISX35	PFC065SW
220/240	7650	425	54	235	0.59	N/A	V110	BY22d	BZSX55	ISX5590	PFC065SW
220/240	12750	528	68	290	0.94	N/A	H20	BY22d	BZSX90	ISX5590	PFC25SW
220/240	22000	775	68	410	0.95	N/A	H20	BY22d	Z1633P *	N/A	PFC1544SW
220/240	32000	1120	68	585	0.90	N/A	H20	BY22d	Z1633P *	N/A	PFC1544SW
SOX-E											
220/240	4030	311	54	180	0.62	N/A	V110	BY22d	BZSX35	ISX35	PFC08SW
220/240	6050	425	54	235	0.61	N/A	V110	BY22d	BZSX55	ISX5590	PFC08SW
220/240	10900	528	68	290	0.98	N/A	H20	BY22d	BZSX90	ISX5590	PFC25SW
220/240	16500	775	68	410	0.98	N/A	H20	BY22d	Z1633P *	N/A	PFC1544SW
220/240	26500	1120	68	595	0.96	N/A	H20	BY22d	Z1633P *	N/A	PFC1544SW

* 220/240V



TECHNICAL NOTES

1 The information in this Guide is typical and should not be regarded as definitive for individual lamps.

2 Rated Lumens: stated figures represent lumen output measured after 100 hours operation for discharge lamps, and after one hour for filament lamps. When planning any installation, note should be taken of lumen depreciation curves.

3 Dimensions provided are maximum figures in mm. Where appropriate, bulb diameters are provided excluding pips. Light centre lengths (a) are nominal values.

4 Photometric charts show approximate illuminance levels for lamps operated at correct voltage. Illuminance figures, quoted in Lux, are those at the centre of the beam at various distances from the lamp. Diameter sizes indicate approximately where the illuminance is half that at the centre.

5 Where ANSI codes are shown, OSRAM lamps will have at least the same cap, wattage and light centre position as the ANSI type, but there may be small differences with other parameters.

6 Ignitors with the prefix IS and ISH are superimposed pulse types and should be used in very close proximity with the lamps. ISR prefix impulse ignitors are available from OSRAM for remote installations up to 30 metres.

7 SON lamps over 70W with internal starters marked ⚠ are not suitable for use on circuits with superimposed pulse ignitors. They are, however, suitable for use with impulse ignitors where quick hot-restart is required.

8 Where the burning positions of lamps are restricted, they are included in data tables and are also shown diagrammatically. 'U' signifies a Universal burning position.

9 Wattages given for HID lamps may vary according to the control gear used, and supply voltage.

10 For circuit current information of discharge lamps, please refer to luminaire Specifier Guides or other literature.

11 In general, lamps are designed to comply with relevant British and CENELEC Standards and IEC publications, where applicable.

12 Where mains voltages are shown for discharge lamps, they are those on which the lamps are typically operated. Ballast tappings suitable for the actual supply voltage should be used. The lower value shown is the minimum supply voltage.

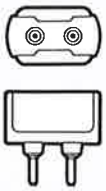
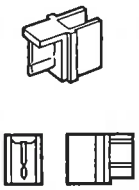
13 For maximum lamp and control gear life and efficacy of SON or HQI, the average supply voltage during the hours of use should be within ± 5 volts of the rated voltage of the choke tapping.
Extended periods of use when the supply voltage is more than 5% above the nominal may result in significant shortening of lamp and control gear life.

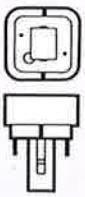
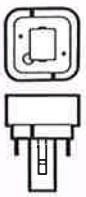
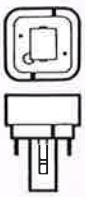
14 The suffix W on SOX capacitors denotes those supplied with wire leads (solid core) for street lighting applications. The suffix should be deleted for other applications.

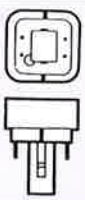
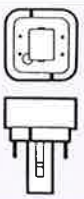
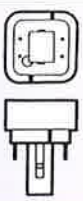
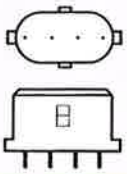
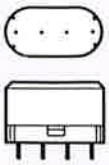
15 To ensure that lamps are used safely, luminaires should be designed to comply with the requirements of BS 4533 (CENELEC 60598 and IEC publication 598). For some luminaires, especially fluorescent, there are statutory requirements relating to radio interference.

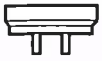
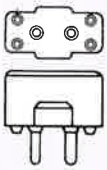
STANDARD CAPS AND BASES

CAP/BASE							
							
IEC DESIGNATION	E 14	E 27	E 40	BA 15 d	B 15 d	B 22 d	BY 22 d
STANDARD DESIGNATION	SES	ES	GES	SBC	SBC	BC	

CAP/BASE				
				
IEC DESIGNATION	G 12	R 7 s	Fc 2	G 10 q

CAP/BASE				
				
IEC DESIGNATION	G 23	G 24 d-1	G 24 d-2	G 24 d-3

CAP/BASE					
					
IEC DESIGNATION	G 24 q-1	G 24 q-2	G 24 q-3	2 G 7	2 G 11

CAP/BASE								
								
IEC DESIGNATION	G4	G 53	GY 6,35	GX 5,3	GZ 4	G 13	G 5	GY9.5

INDEX

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Designed and Produced by
Enskat Design and Marketing

OSRAM

Northern Ireland
Linfield Industrial
Estate, Linfield Road,
Belfast BT12 5GL
0232-238125

Scotland, South West and South Wales
Lea Green Road,
St. Helens, Merseyside
WA9 4QQ
0800-269987
Freephone ☎

North West, Yorkshire, North Wales and North Midlands
Lea Green Road,
St. Helens, Merseyside
WA9 4QQ
0744-812221

North East
Enterprise House,
Kingsway, Team Valley
Trading Est., Gateshead
NE11 0SR
091-4878575

South and South Midlands
P.O. Box 17, East Lane,
Wembley HA9 7PG
01-908 5111
Telex: 22418

Head Office
P.O. Box 17, East Lane,
Wembley HA9 7PG
01-904 4321
Telex: 22418