THORN LIGHTING

COMPREHENSIVE CATALOGUE 1975/76

Introduction

Thorn Lighting offers the widest choice of discharge lamps in the country. This range enables you to select lamps with the best combination of light output and colour to satisfy your particular requirements. And so, because you get the right lamp for the job, you enjoy maximum operating efficiency and minimum maintenance costs.

Kolorarc lamps, with their special metallic additives, have no challengers for really accurate colour rendering, so accurate that they have been proved suitable light sources for use with colour television. In any commercial or industrial situation where high light output combined with accurate colour rendering is demanded, Kolorarc lamps are ideal.

Kolorlux lamps combine good colour with a wide range, stretching from 50W to 1000W, giving exceptional flexibility. The MBFR version, with its internal coating, gives improved lumen maintenance in industrial situations and lowers operating costs.

Kolor-Plus MBTF lamps take this flexibility even further by requiring no control gear and make excellent long-life replacements for ordinary tungsten filament lamps—especially where maintenance is difficult and costly.

The KolorSON high pressure sodium lamp is the most efficient in the Kolor range, producing a brilliant golden light. It is becoming increasingly popular for exterior lighting where improved colour is needed, and also for interior use where warm colour is acceptable and high efficacy vital.

The Linear Sodium and SOX lamps are for outdoor and streetlighting applications and achieve the highest possible light output for the lowest cost.

All these discharge lamps have been developed by Thorn's incomparable research and design facilities and backed by Britain's largest distribution network.

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General lamp information

Lighting Advisory Service
Discharge lamps are compact, high output sources and their successful use, particularly in commercial interiors, is dependent on the optical control provided by the luminaire. In addition, interior lighting design requires careful attention to layout and decor to ensure visual satisfaction.
The advice of Thorn Lighting engineers is available on request.

Initial Lumens
The initial lumens quoted are measured after 100 hours operation.

Lighting Design Lumens
Lighting design lumens quoted are the lumen outputs at 2000 hours (3000 hours for SLI and SOX) and are recommended as a guide to Lighting Engineers planning scheme layouts. Lumen output beyond 2000 hours decreases by 2-3% per 1000 hours use according to type.

Supply Voltage
All lamps are suitable for use on 220V and 240V supplies in conjunction with control gear.
All Mercury, Metal Halide, low and high pressure Sodium lamps described in this section will start and continue to operate with a 10% reduction in the rated voltage (220V or 240V) provided that the correct control gear is used. Kolor-Plus Mercury Tungsten lamps must be operated on the correct supply voltage.

Ambient Temperature
Lamps described in this section will start at ambient temperatures down to −20°C. The diagram shows the effect of ambient temperature on the starting voltage of mercury lamps.

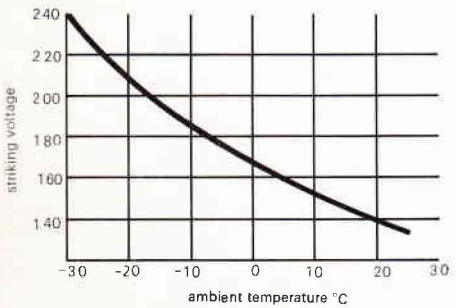
Standards
Lamps conform to the following standards where applicable :—
BS 3677 : High Pressure Mercury Vapour Lamps.
BS 3767 : Low Pressure Sodium Vapour Lamps.
IEC Publication 188 : High Pressure Mercury Vapour Lamps
IEC Publication 192 : Low Pressure Sodium Vapour Lamps

Dimensions
The dimensions shown are maximum.

Cap Designations
ES – E27
GES – E40
BC – B22
3 pin BC – B22-3
BIPIN – G13

Run-up Time
The following table shows typical run-up times to 90% light output. The time taken will vary depending on the location and the type of fitting housing the lamp.

MB, MBF, MBFR		SON, SON-T, SON-TD	
50W	5 mins	250W	7 mins
80W	3 mins	400W	5 mins
125W	3 mins	SLI	
250W	4 mins	140W	12 mins
400W	4 mins	200W	7 mins
700W	3 mins	SOX	
1000W	2 mins	35W	6 mins
MBI, MBIF		55W	6 mins
250W	2 mins	90W	7 mins
400W	2 mins	135W	8 mins
1000W	2 mins	180W	11 mins



Kolorarc MBIF and MBI metal halide lamps

Description High pressure discharge in mercury with metallic additives operating in a quartz arc tube. Kolorarc (MBIF) lamps have hard glass elliptical bulbs coated on the interior surface with fluorescent phosphor increasing the light output, improving the colour and diffusing the arc.
MBI lamps have clear hard glass elliptical bulbs. The special additives in the arc help provide a more continuous spectral power distribution throughout the visible spectrum. At the same time the mercury resonance lines are reduced in comparison with ordinary mercury lamps, giving a light source with excellent colour rendering properties comparable to a Natural fluorescent tube.

Application In any situation where high light output must be combined with good colour rendering, Kolorarc lamps are ideal. They can be used indoors for offices, shops, supermarkets and stores, where colour is of primary importance, and are finding increasing application for illuminating interior sports halls, gymnasia and swimming pools.
The excellent colour rendering of Kolorarc makes it suitable for museums and exhibitions where skilled lighting design can enhance the beauty of the exhibits.
Industrially, Kolorarc lamps can be used in area and high-bay lighting where good colour qualities, coupled with high output efficiency, are required : Kolorarc lamps are 30% more efficient than MBF colour corrected mercury lamps. The high lumen output is of primary importance where the weight of fittings on the ceiling is a serious consideration. MBI lamps, with clear outer bulbs, are suitable where precise optical control is required, such as floodlighting. Kolorarc and MBI lamps have proved suitable light sources for use with colour television cameras. Other varieties of metal halide lamps are being increasingly used for stadia floodlighting, especially that of football grounds.

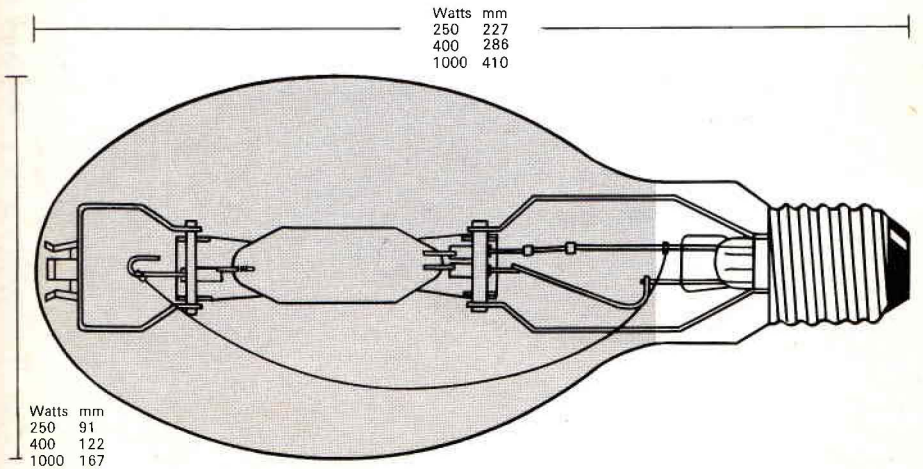
Burning Position BU : Base up. Lamps must *not* be operated with cap more than 15° below horizontal. For general industrial use.
BD : Base down. Lamps must *not* be operated with cap more than 15° above horizontal.
H : Horizontal. For use in commercial fittings with orientated lampholders when the lamps are intended to be burnt ±15° of horizontal.

Further Information For further information see page 336

RANGE

	Watts	Burning Position	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lumens Initial	Lighting Design	Standard Pack
MBIF Kolorarc	250	BU and H	90	3.1	GES	19000	16000	10
	400	BU† and H	135	3.3	GES	32000*	27000*	10
	1000	BU†	250	4.2	GES	92000*	85000*	1
MBI	400	BU†	135	3.3	GES	29000*	24000*	10
	1000	BU†	250	4.2	GES	85000*	78000*	1

*Applies to vertical position : when operated horizontally reduce by 10%
†BD available to order



Kolorlux MBF mercury fluorescent lamps

Description High pressure mercury vapour discharge operating in a quartz arc tube. The interior surface of the elliptical bulb is coated with a fluorescent phosphor which converts ultra-violet radiation from the discharge into visible light. Kolorlux lamps employ a phosphor giving up to 10% higher light output than standard MBF lamps together with improved colour at the red end of the spectrum.

Applications MBF lamps are widely used in industrial lighting and streetlighting. The improved colour of Kolorlux has extended the applications to commercial and display lighting, shopping centre and concourse lighting, and area floodlighting. In comparison with fluorescent tubes, higher output Kolorlux lamps need fewer fittings for an equivalent illumination level, giving a tidier ceiling and reduced maintenance costs

Burning Position Universal : lamps may be operated in any position.

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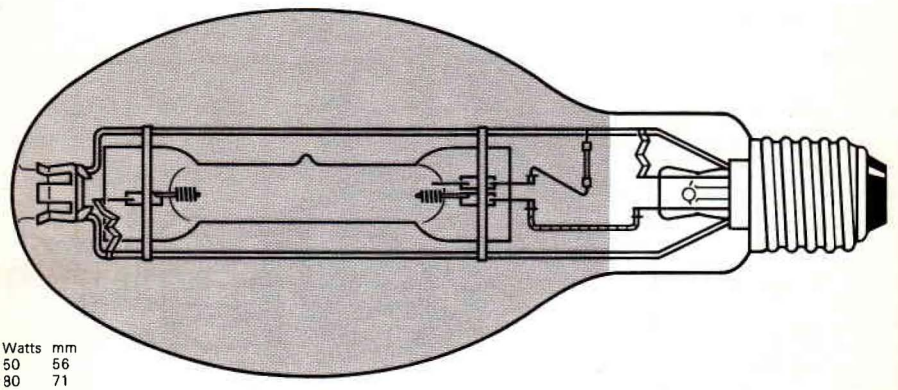
RANGE

Watts	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lumens Initial	Lighting Design	Standard Pack
50	95	0.6	ES	1900	1800	50
80	115	0.80	ES*	3600	3350	25
125	125	1.15	ES*	6250	5550	25
250	130	2.15	GES	13500	12000	10
400	135	3.25	GES	23000	21500	10
700	140	5.60	GES	40000	38000	1
1000	145	7.60	GES	56000	54000	1

*3 pin BC cap also available.
A range of MB lamps is also available : details on request.

Watts	mm	Watts	mm
50	129	400	286
80	154	700	328
125	175	1000	410
250	227		



Watts	mm
50	56
80	71
125	76
250	91
400	122
700	143
1000	167

Description High pressure mercury vapour discharge operating in a quartz arc tube. A shaped outer bulb forms an integral reflector. The upper portion of the bulb is coated with a reflecting layer which directs most of the light downward but allows some upward light. This internal reflector is unaffected by atmospheric corrosion and dirt collection so that the lamp requires the minimum maintenance. The introduction of Kolorlux phosphor into the range of reflector lamps gives a greatly improved colour and up to 10% higher output than previously available with standard MBFR lamps.

Application Kolorlux reflector lamps are particularly suitable for medium and high bay lighting. The hard glass outer bulb allows the lamps to be used in exposed conditions for area lighting. The improved colour of Kolorlux has widened the use of reflector lamps into commercial applications such as display lighting.

Burning Position Universal : lamps can be operated in any position.

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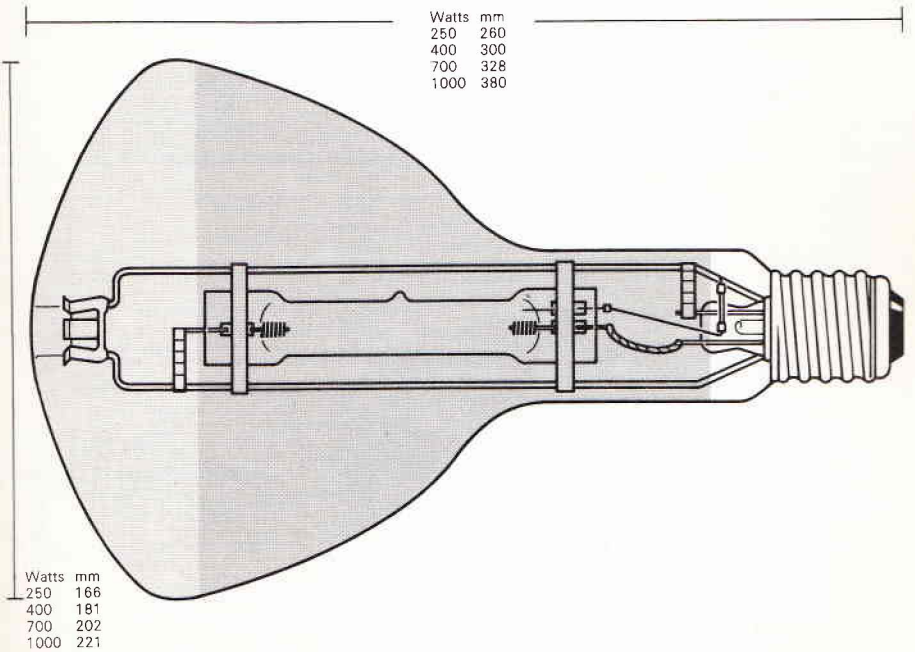
RANGE

Watts	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lumens Initial	Lighting Design	Standard Pack
250	130	2.15	GES	11500	10500	1
400	135	3.25	GES	20500	18000	1
700	140	5.60	GES	35000	32500	1
1000	145	7.60	GES	52000	48000	1



Kolor-Plus MBTF and Black Light MBTW mercury tungsten lamps

Description Mercury tungsten lamps consist of a high pressure mercury discharge in a quartz arc tube. Mounted coaxially with the arc tube and connected in series with it is a coiled tungsten filament which provides light and colour correction to the output of the mercury discharge and acts as a ballast to the arc.
No control gear is needed. Mercury tungsten lamps operate direct from the supply. All ratings have elliptical outer bulbs.
Kolor-Plus MBTF lamps (illustrated below) have an outer bulb coated with a phosphor giving higher light output and improved colour.

The MBTW lamp has a pear shaped 'Black Light' outer bulb (length 183mm diameter 91mm) which effectively obscures all visible radiation, and emits long wave ultra-violet.

Application Kolor-Plus MBTF lamps can be used as direct replacements for tungsten filament lamps giving higher light output and longer life. They are particularly suitable where labour costs are high and access is difficult. Applications include shop windows, garages, warehouses, streetlighting and in wellglass and flameproof fittings.

The MBTW lamp is a very convenient way of providing Ultra Violet lighting ('Black Light') for fluorescent effects in dance halls, clubs, discotheques, parties etc.

Advantages Kolor-Plus MBTF lamps
–offer eight times the life of GLS lamps
–plug directly into the mains : no need for control gear
–give a large proportion of their light output immediately after switch-on
–give greater lumen output than equivalent GLS lamps
–save labour costs on replacement.

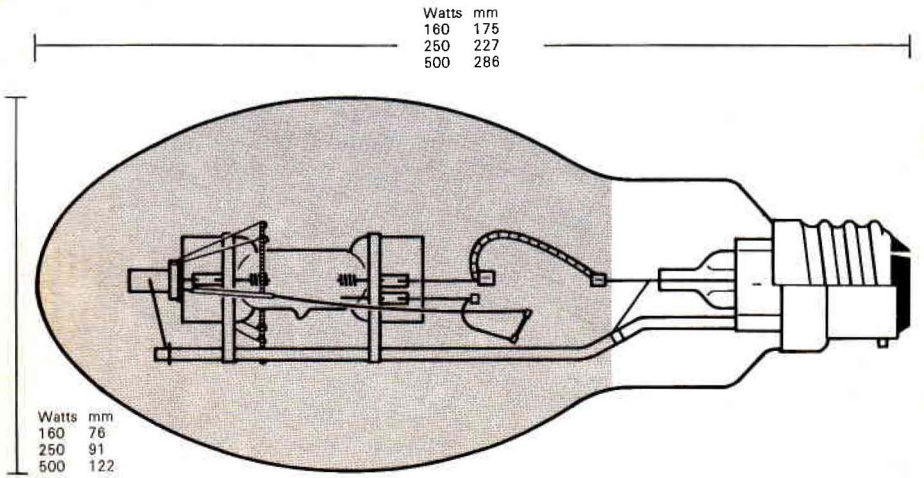
Supply Voltage Kolor-Plus MBTF lamps are available in 240/250V The lamps must be operated on the correct supply. Sudden reductions in voltage may cause them to extinguish.

Rated Life MBTF—8000 hours
MBTW—3000 hours

Operating Position Kolor-Plus lamps are designed for operation in the cap up position ; 250 and 500W ratings may be operated in other positions provided there is negligible fluctuation in the supply voltage.

RANGE

	Watts	Supply Voltage	Lamp Current Amps	Cap	Lumens Initial	Lumens Lighting Design	Standard Pack
MBTF	160	240/250	0.65	BC or ES	2900	2560	24
	250	240/250	1.05	GES	5500	4840	10
	500	240/250	2.10	GES	12500	11500	10
MBTW	175	240/250	0.70	BC or ES	—	—	10



KolorSON and SONline high pressure sodium lamps

Construction The high-pressure sodium lamp differs from other discharge lamps in that it employs an arc tube made of sintered aluminium oxide. This material is necessary to withstand the intense chemical activity of sodium vapour at high temperature and pressure.
Three types of outer bulb are available :
1) SON **KolorSON**
Elliptical hard glass with a diffusing coating. This lamp has the same luminance ratio as an MBF lamp and can be used in the same fittings. (Different control gear is required).
2) SON-T
Tubular clear hard glass, for floodlighting purposes.
3) SON-TD **SONline**
Tubular double-ended clear quartz. The length and cap are the same as for a 1500W tungsten halogen floodlighting lamp. Designed for use in TH floodlighting fitting in conjunction with suitable gearbox. In comparison with 1500W TH lamp, the 400W SONline gives 27% more light, ⅓ of the power consumption and 3 times the life.

Starting and Operation The lamp is started by a high-voltage pulse applied by an ignitor which ceases to function once the arc has struck. The ignitor may be mounted up to 45 metres from a 250W lamp and 30 metres from a 400W lamp. External starting simplifies lamp construction, ensures immediate striking and is very reliable. The lamp takes four or five minutes to run up to full brightness. SON lamps will normally restrike within one minute of extinction and rapidly regain full light output. This is a most important feature for interior use and a considerable improvement on the restriking times of mercury lamps.

Colour The colour appearance of the lamp resembles that of a black body at 2100K a pleasant golden white. When the arc is run up the monochromatic yellow characteristic of low-pressure sodium lamps disappears and is replaced by a broader distribution across the visible spectrum. This gives acceptable colour rendering with a warm appearance and, although blues and greens are somewhat subdued, reds and yellows are enhanced and all colours are easily distinguishable.

Applications Public lighting : traffic routes, city centres, shopping areas.
Area lighting : airports, dockyards, car parks, forecourts.
Floodlighting : stadiums, buildings, marshalling yards, sports grounds. Interior lighting : high-bay lighting for factories, warehouses, hangars, halls.
The Department of the Environment have recommended that high pressure sodium lamps be used for street lighting in conservation areas, both in the country and the town.

Burning Position SON and SON-T
Universal : lamps may be operated in any position.
SON-TD
Horizontal ± 20°

Further Information For further information see page 336

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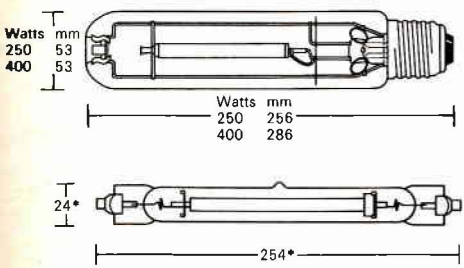
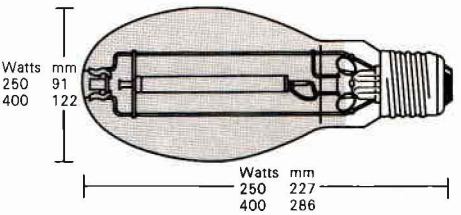
Watts/Type	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lumens Initial	Lumens Lighting Design	Standard Pack
250 Tubular SON-T	100	3.0	GES	25000	22500	12
250 Elliptical SON	100	3.0	GES	23500	21000	10
400 Tubular SON-T	105	4.4	GES	47000	42000	12
400 Elliptical SON	105	4.4	GES	44000	40000	10
400 SON-TD*	105	4.4	RX7s	47000	42000	10

*The lumen output and electrical characteristics of this lamp refer to operation under optimum conditions in a suitable fitting. The quoted performance will not be achieved in free air.





*Nominal Dimensions

Linear SLI/H sodium lamps

Description The lamp consists of a low pressure sodium discharge operating in a linear arc tube. The arc tube is enclosed in an evacuated tubular outer bulb which has an infra-red reflecting coating on the inside surface to provide thermal insulation.

Special Advantages The small source size and uniform distribution of both the 140W and 200W ratings conform to the design requirements of modern streetlighting lanterns. Light is emitted uniformly from an arc 780mm long and only 29mm wide. The compact and lightweight construction makes it easy to handle during relamping. The lamp is 908.8mm/3ft long and 39.5mm/1.5in in diameter and weighs less than 0.45kg/1lb. Transport and installation are further simplified by a 25-way pack which can easily be stored in a service truck or tower wagon.

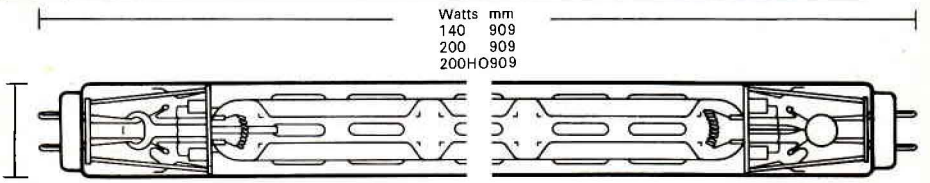
Spectral Distribution The discharge has a characteristic yellow colour, almost all the visible energy being concentrated at 589/589.6 nm.

Application The primary application for linear sodium lamps is for streetlighting where their outputs are suitable for the DoE requirements for principal and trunk roads, and motorways. The construction of the lamp materially assists in the optical design and shape of lanterns to meet illuminance distribution and environmental criteria.

Operating Position The lamps must operate in a horizontal position ± 20°

RANGE

Watts	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lighting Design Lumens	Standard Pack
140	175	0.9	Bi-pin	20000	25
200	145	1.6	Bi-pin	25000	25
200 (HO)	145	1.6	Bi-pin	27500	25



Watts mm
140 909
200 909
200HO909

Watts mm
140 39.5
200 39.5
200HO39.5

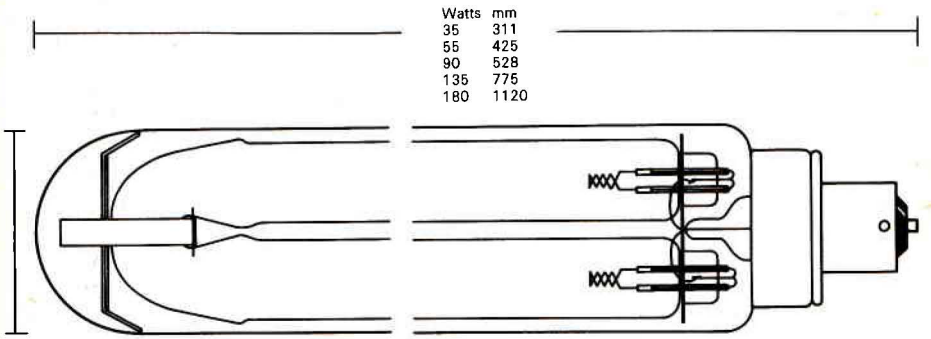
Description Low pressure sodium discharge operating in a U-shaped arc tube. The U-tube is enclosed in a tubular outer bulb which has a reflector coating on the inside surface to provide thermal insulation. This construction provides a lamp of considerable higher efficacy than the integral type which is now obsolete.

Application The primary application for SOX lamps is for streetlighting where their higher efficacy has superseded earlier types as follows:
1/ The 90W SOX lamp replaces the 140W SOI/H integral lamp. Both lamps have the same dimensions and can be operated from the same control gear.
2/ The 55W SOX lamp replaces the 85W SOI/H integral lamp. Both lamps have the same dimensions and can be operated from the same control gear.
3/ The 35W SOX lamp replaces the 60W SOI/H integral lamp. Both lamps have the same dimensions and can be operated from the same control gear.
4/ The 35W SOX lamp is also electrically interchangeable with the 45W SOI/H integral lamp. Although the 35W SOX is longer than the 45W SOI/H it can be used as a replacement in lanterns originally designed for 45/60W SOI/H.

Burning Position Horizontal ± 20°.
The 35W and 55W ratings may also be operated in the vertical cap up position.

RANGE

Watts	Nominal Lamp Voltage	Lamp Current Amps	Cap	Lighting Design Lumens	Standard Pack
35	70	0.6	BC	4300	9
55	109	0.59	BC	7500	9
90	112	0.94	BC	12500	9
135	164	0.95	BC	21500	9
180	240	0.91	BC	31500	9



Watts	mm
35	311
55	425
90	528
135	775
180	1120

Watts	mm
35	53
55	53
90	67
135	67
180	67