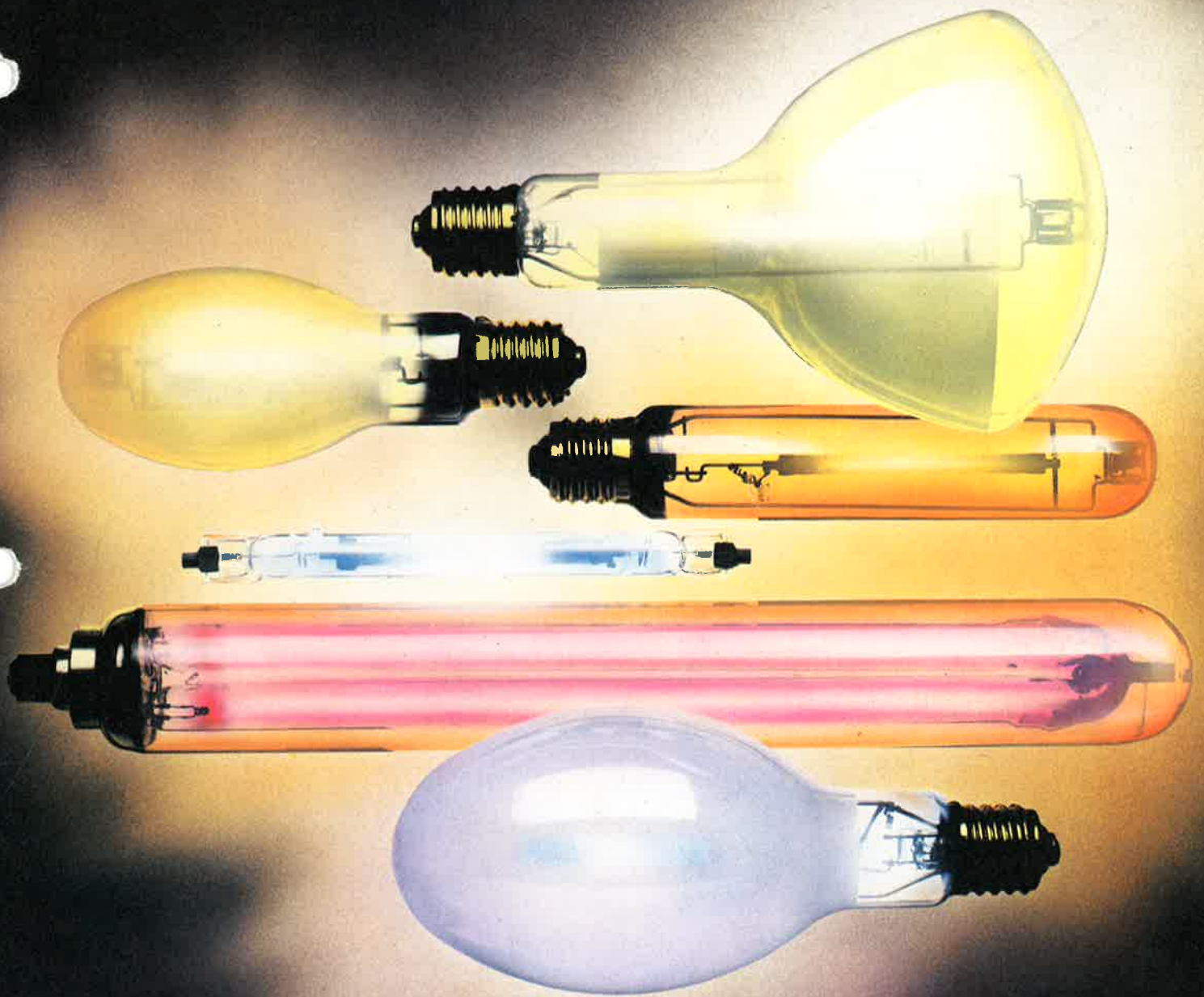


Thorn discharge lamps

Improved lighting efficiency

Lower power consumption

Reduced maintenance costs



THORN
LIGHTING

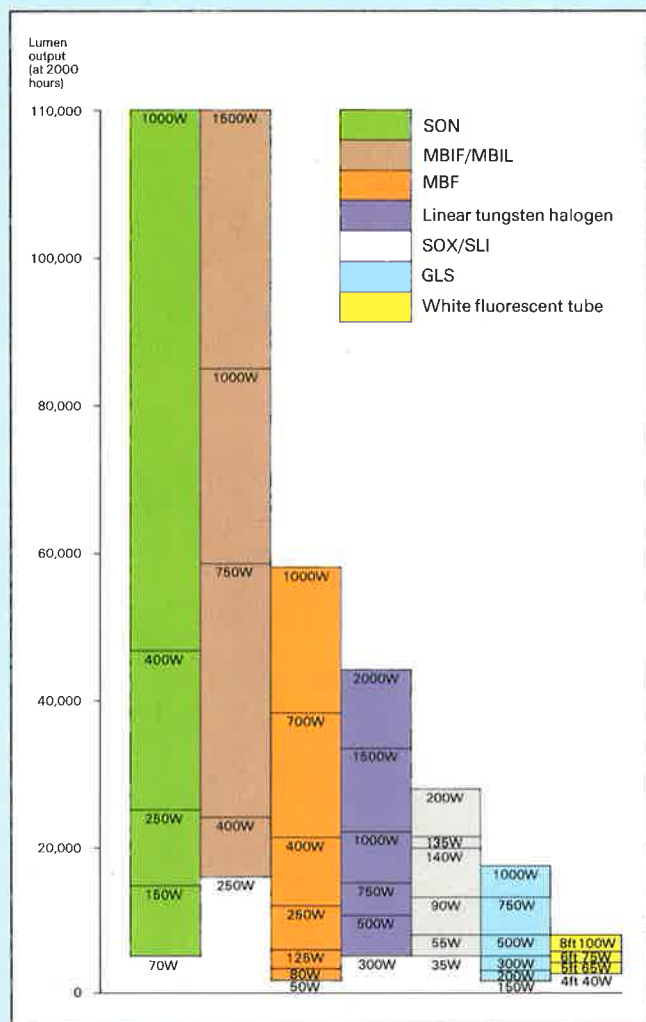
Facts behind discharge lamps

If you are responsible for a production area, especially one with a high ceiling, or an outside area where work or leisure activities take place after dark, then you need to know about discharge lamps because they are, without doubt, today's light source with a great future.

Consider these facts:

The best discharge lamps give ten times as much light per watt as incandescent lamps. They can also last at least ten times as long. Benefits which can dramatically reduce your electricity and maintenance costs.

Light output comparison



Efficiency and colour

Discharge lamps don't have filaments, like incandescent lamps, but operate by the emission of light from vaporised mercury or sodium. Their efficiency was recognised many years ago, but colour rendering was a problem. Now things are different, very different. Over the last few years, Thorn have produced an amazing range of sodium and colour corrected mercury light sources. They are superb for outdoor floodlighting or area lighting and most are ideal for indoor use, where long burning hours are anticipated.

Simple to operate

Many people think that discharge lamps are complicated; actually they aren't. Like fluorescent tubes they normally require control gear to start and operate them. To get the best out of them you need to have suitable fittings, and preferably the advice of an electrical contractor, or one of Thorn's lighting engineers.

Economic lamp life

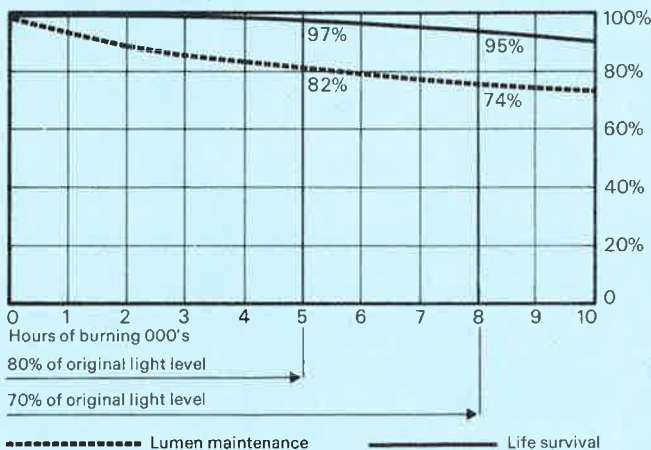
Many discharge lamps will continue to operate beyond the point where the light output has fallen below an

acceptable level. Lamp replacement should take place when the combined effect of decreasing light output and lamp failure reaches the minimum acceptable lighting level to the user. This will vary according to the type of location and work function.

These characteristics, which will vary with different lamp types, are shown in the form of Life survival and Lumen maintenance curves. The assessment of performance should also include the effect of dust and dirt accumulating on the lighting fittings.

Lumen maintenance/life survival curves

(An example using MBF mercury lamps)



In this leaflet we explain the various types of discharge lamps to help you select the right kind of lamp for your particular lighting needs.

Lamp types

SON	High pressure sodium (bulb)
SON-T	High pressure sodium (tubular)
SON-TD	High pressure sodium (tubular-double ended) For use with Haline floodlights and appropriate gear.
MBF	Mercury (bulb) with fluorescent coating
MBFR	Mercury (bulb) fluorescent reflector
MBTF	Mercury (bulb) tungsten fluorescent (no control gear required)
MBIL	Linear metal halide, double ended. This lamp has no outer jacket, and should be used with the ON/1600 floodlight.
MBIF	Mercury halide (bulb) with fluorescent coating
SOX	Low pressure sodium (single ended tubular)
SLI/H	Low pressure sodium (double ended linear)

Advisory service

Discover how the Thorn range of discharge lamps can work to reduce your energy bills by taking advantage of our advisory service. Qualified lighting engineers will visit your premises and calculate the power savings to be made. You will also be advised on the most suitable fittings to suit your particular need.

If you would like to take advantage of this advisory service contact your nearest Thorn regional office, listed on the back page.



SON high pressure sodium lamps

These are the discharge lamps which, thanks to modern technology, give a consistent golden white light in which it is possible to distinguish colours. They require the minimum of attention and energy costs are drastically reduced.

Four types of outer bulb are available:

1 SON

An elliptical hard glass high pressure sodium lamp with a diffusing coating. Increasing the vapour pressure in sodium discharge lamps results in a warm golden light in which it is possible to distinguish colours. These lamps are for use in situations where some colour discrimination is needed but accurate colour rendering is not required. Available in wattages from 70W to 1000W; with dimensions the same as equivalent high-pressure mercury lamps they may be accommodated in similar fittings and floodlight projectors with appropriate control gear.

2 SON-T

This is a tubular version of the SON lamp. Clear hard glass envelope and available in 250W and 400W.

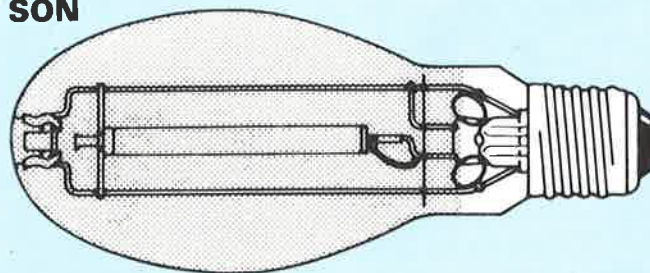
3 SON-TD

A double ended tubular lamp with clear quartz sleeve. These lamps are specially designed for floodlighting use, and used in Thorn Haline fittings give a superbly efficient beam of light. They are available in 250W and 400W ratings, and run at 104 lm/W and 120 lm/W respectively.

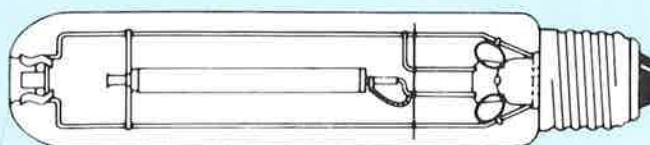
4 SON-R

A 70W soft glass reflector bulb designed primarily for downlighter and display uses in commercial interior lighting.

SON



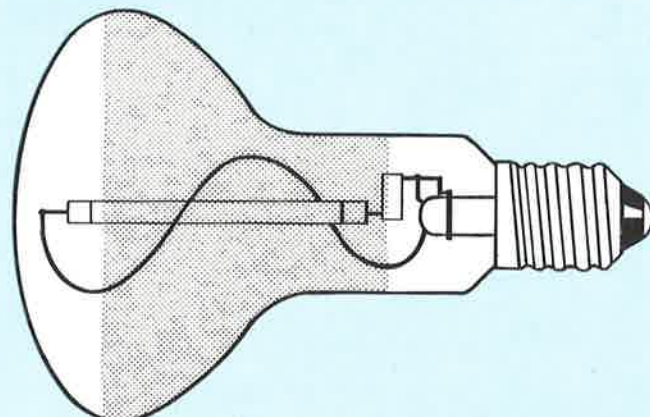
SON-T



SON-TD



SON-R



Dimensions
See p7

Applications

Public lighting; floodlighting; industrial and commercial lighting.

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. External starting simplifies lamp construction, ensuring immediate striking and reliability. The lamp takes about five minutes to run up to full brightness and has an average restrike time of 30 seconds from extinction, rapidly regaining full light output. This is an important feature for interior use and a considerable improvement on the restriking times of mercury lamps.

Colour

A pleasant golden white appearance with reasonable colour rendering. Blues and greens are somewhat subdued, yellows and reds are enhanced. All colours are distinguishable.

Operating position

SON and SON-T – Universal.

SON-TD – Horizontal $\pm 20^\circ$

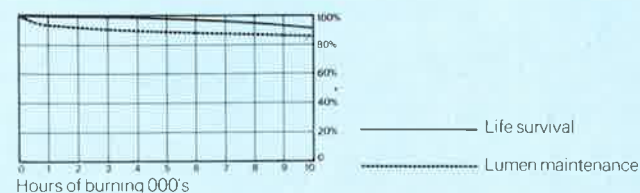
(May be operated vertically but full life may not be achieved).

Range*

Lamp reference	Nominal lamp voltage	Lamp current amps	Cap	Nominal lumens at		Standard pack
				100 hrs	2000 hrs	
70W SON-R	90	0.98	E27	5800	5300	24
150W SON	100	1.8	E40	15500	15000	10
250W SON	100	3.0	E40	26500	25500	10
400W SON	105	4.4	E40	46000	45000	10
1000W SON	110	10.3	E40	120000	110000	4
250W SON-T	100	3.0	E40	28000	27000	10
400W SON-T	100	4.6	E40	48000	47000	10
250W SON-TD	100	3.0	RX7s	28000	25000	10
400W SON-TD	105	4.4	RX7s	48000	46000	10
70W SON-R	90	0.98	E27	6400	Peak beam candelas	10

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

†Clear version also available



In situations where perfect colour rendering is not vital but where a pleasant warm light is needed SON high pressure sodium lamps are an ideal solution in Thorn Lo-Pak and Hi-Pak fittings.



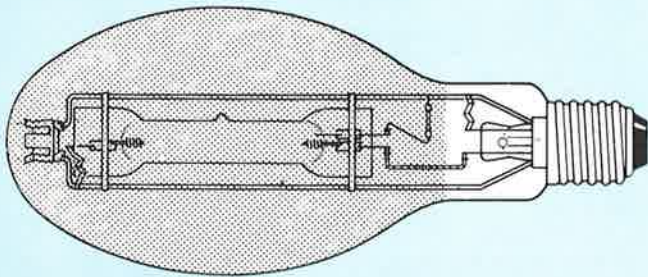
Mercury discharge lamps

Mercury discharge lamps form the largest group of discharge lamps and fall into two categories, though of a slightly different kind from sodium. All the bulb shaped mercury lamps are single ended and like sodium lamps cannot be operated direct from an electrical supply. The main difference between these two types is the structure of the arc tube and the internal phosphor coating.

Kolorlux mercury lamps use fluorescent powders to give a warmer colour appearance and in Kolorarc mercury lamps the addition of metal halides and a fluorescent coating produce a light closely resembling natural daylight.

As with sodium there is a mercury double ended linear version. This is designed for use in our ON 1600 light fitting using a compact reflector system giving a tightly controlled beam of high intensity.

Kolorlux MBF mercury fluorescent lamps



Dimensions
See p7

Description

High pressure mercury vapour discharge operating in a quartz arc tube. The interior surface of the outer bulb is coated with a fluorescent phosphor which converts ultra-violet radiation from the discharge into visible light.

Applications

Industrial and streetlighting, commercial and display lighting, shopping centre and concourse lighting, and area floodlighting.

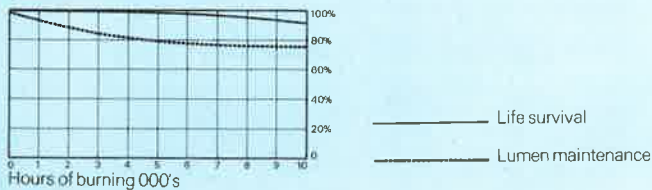
Operating position

Universal.

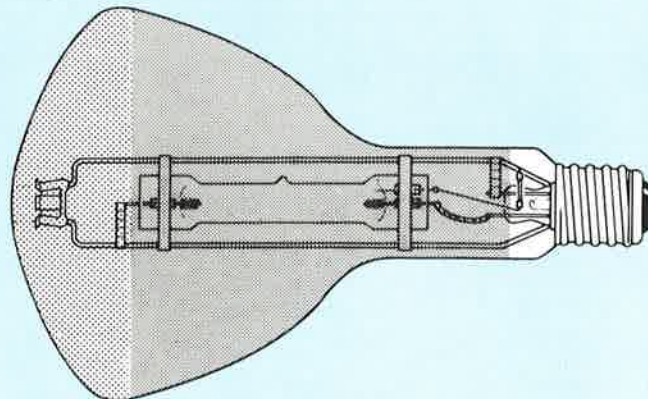
Lamp reference	Nominal lamp voltage	Lamp current amps	Cap	Nominal lumens at		Standard pack
				100 hrs	2000 hrs	
50W MBF	95	0.6	E27	2000	1900	50
80W MBF†	115	0.80	E27*	3850	3650	36
125W MBF†	125	1.15	E27*	6300	5800	36
250W MBF†	130	2.15	E40	13500	12500	10
400W MBF†	135	3.25	E40	23000	21500	10
700W MBF	140	5.60	E40	42000	38000	1
1000W MBF	145	7.60	E40	62000	58000	1

*B22d - 3 Cap also available for replacement only.

† De Luxe colour also available in these ratings.



Kolorlux MBFR mercury reflector lamps



Dimensions
See p7

Description

High pressure mercury vapour discharge operating in a quartz arc tube. A shaped outer bulb is coated with a reflecting layer which directs most of the light downwards but allows some upward light. This internal reflector is unaffected by atmospheric corrosion or dirt collection, so that the lamp requires minimum maintenance.

Applications

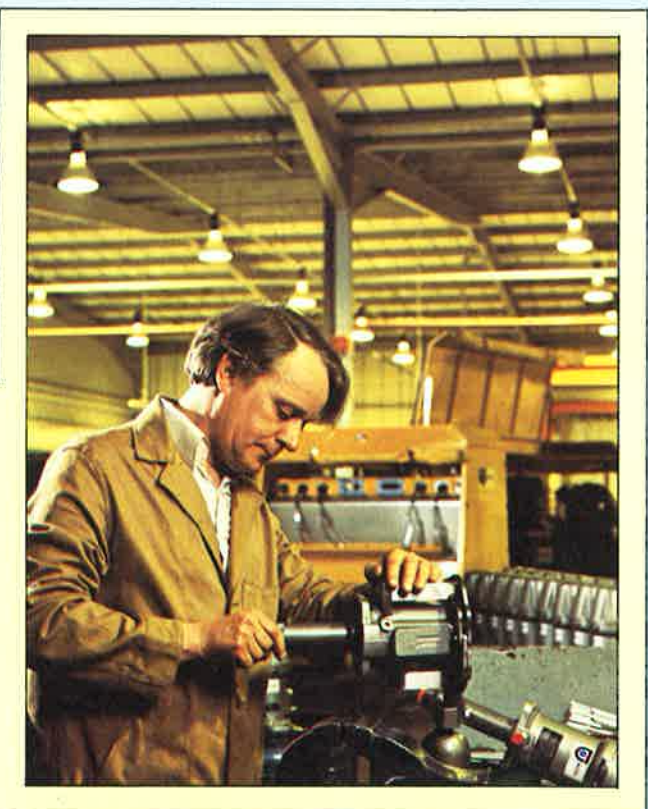
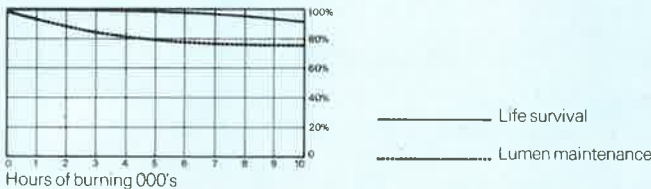
For medium and high-bay lighting.

Operating position

Universal.

Range

Lamp reference	Nominal lamp voltage	Lamp current amps	Cap	Nominal lumens at		Standard pack
				100 hrs	2000 hrs	
250W MBFR	130	2.15	E40	11500	10500	1
400W MBFR	135	3.25	E40	20500	18000	1
700W MBFR	140	5.60	E40	35000	32500	1
1000W MBFR	145	7.60	E40	52000	48000	1

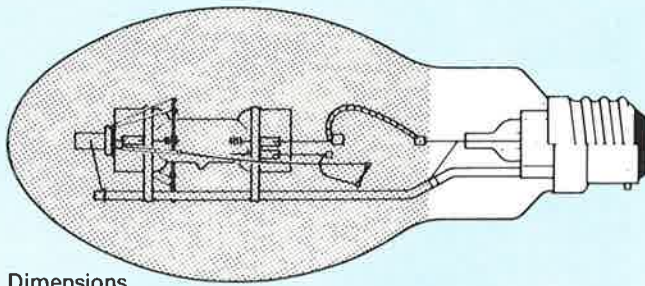


Kolorlux high pressure mercury fluorescent lamps are ideal for warehouses and factories with high ceilings where an even distribution of light is essential. These locations always pose a lighting problem and a sensible alternative to using conventional light sources suspended on long chains or conduits, is to use Kolorlux lamps in Hi-Pak fittings.

Gymnasias, sports halls, school halls, passenger and shopping concourses are other locations with high ceilings which can benefit from Thorn mercury fluorescent lighting.

Kolorlux lamps may of course be used in low ceiling installations too, for which purposes our Lo-Pak fittings are designed. In fact Kolorlux lamps with their wide range of wattages (50W-1000W) have universal applications in industry and commerce.

Kolor-Plus MBTF mercury tungsten lamps



Dimensions
See p7

Description

High pressure mercury discharge operating in a quartz arc tube. A coiled tungsten filament is connected in series with the arc tube and acts as a ballast to it. The lamp operates directly from the supply. The elliptical outer bulb is coated with a phosphor to give improved colour and light output.

Applications

Can be used as direct replacements for tungsten filament lamps, giving higher light output and longer life. Suitable where access is difficult – in Wellglass and flameproof fittings and for shop windows, garages, warehouses and streetlighting.

Supply voltage

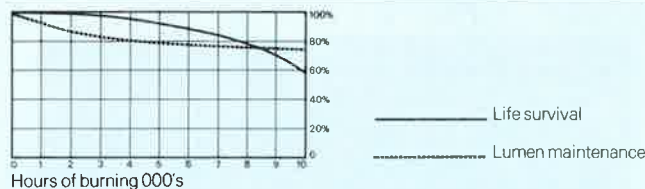
Available for 240/250V supplies. The lamps must be operated on the correct supply as sudden reductions in voltage may cause them to extinguish.

Operating position

Cap up. 250W and 500W ratings may be operated in other positions provided there is negligible fluctuation in supply voltage.

Range

Lamp reference	Supply voltage	Lamp current amps	Cap	Nominal lumens at		Standard pack
				100 hrs	2000 hrs	
160W MBTF	240/250	0.65	B22 or E27	2900	2560	24
250W MBTF	240/250	1.05	E40	5500	4840	10
500W MBTF	240/250	2.10	E40	12500	11500	10



Linear metal halide lamps MBIL



Dimensions
See p7

Description

An arc burning between tungsten electrodes in an atmosphere of mercury and additional metal halides, enclosed in a tubular quartz bulb. The halides are chosen to give a high efficiency light output of good colour rendering and colour appearance approximating to daylight. The lamps are designed to operate as an integral unit with the ON 1600 floodlight.

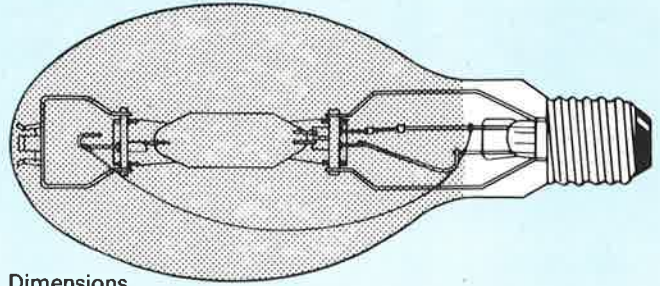
Applications

Exterior, industrial, commercial and sports lighting. The colour rendering properties are well suited for use with colour television.

Characteristics

	750W 91-7461	1500W 91-7473
Cap	Ceramic	Ceramic
Operating position	Horizontal	Horizontal
Supply voltage (ac)	200/250	380/415
Arc voltage	500+25	250+20
Operating current (amps)	1.75	6.7
Nominal rating (watts)	750	1500
Lumens at 100 hrs	67000	120000
Lumens at 2000 hrs	58500	110000
Objective life (hours)	5000	3000
Run-up time to 90% (mins)	2.5	2.0
Hot restrike time (mins) in ON1600		
Floodlight at 25°C ambient	8-12	15-20

Kolorarc MBIF and MBI metal halide lamps



Dimensions
See p7

Description

High pressure discharge in mercury with metallic additives operating in a quartz arc tube.

Kolorarc (MBIF) lamps have elliptical bulbs coated on the interior surface with fluorescent phosphor giving improved colour and diffusion. MBI lamps have clear bulbs.

Applications

In situations where high light output must be combined with good colour rendering. Indoors for stores, supermarkets, offices, museums; area and high-bay lighting; sports halls, gymnasias and swimming pools etc. MBI lamps are suitable where precise optical control is required. Both Kolorarc and MBI lamps have proved suitable light sources for use with colour television cameras.

Operating position

BU: Base up: Permitted operating position is cap up within $\pm 30^\circ$ of the vertical.

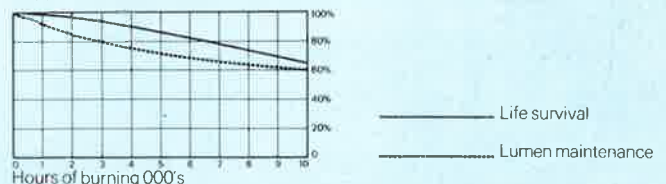
BD: Base down: Permitted operating position is cap down within $\pm 30^\circ$ of the vertical.

H: Horizontal. These lamps have primarily been designed to be operated $\pm 15^\circ$ of horizontal in suitable enclosed commercial fittings with orientated lampholders for best colour uniformity, but can be used up to $\pm 60^\circ$ of the horizontal.

Range

Lamp reference	Burning position	Nominal lamp voltage	Lamp current amps	Cap	Nominal lumens at		Standard pack
					100 hrs	2000 hrs	
250W MBIF	BU & H	100	2.9	E40	19000	16000	10
400W MBIF	H BU & BD	120	3.5	E40	26000 29000	21500 24000	10
1000W MBIF	BU & BD	250	4.2	E40	92000†	85000†	1
400W* MBI	BU & BD	120	3.5	E40	29000†	24000†	10
1000W MBI	BU & BD	250	4.2	E40	92000†	85000†	1

*With appropriate Thom control gear, lamp operates at 375V; lumen outputs as shown.
†Applies to vertical position. If operated horizontally reduce by 10%.



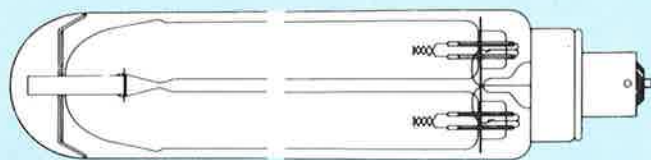
Kolorarc metal halide lamps combine high light output with first class colour rendering. Locations such as retail stores, supermarkets, offices, sports halls, and swimming pools can all benefit from Kolorarc. These lamps can also be used to simulate natural lighting conditions for displays, and they have proved most suitable for use with colour television cameras and for photographic use generally.



Low pressure sodium lamps

Low pressure sodium lamps are well known because of their characteristic yellow-orange light which gives a monochromatic rendering of colours. Their prime use is for road lighting because of their efficiency in producing the best possible amount of light for every watt of electricity consumed.

SOX sodium lamps



Dimensions
See p7

Description

Low pressure sodium discharge operating in a U-shaped arc tube enclosed in a tubular outer bulb which has an internal infra-red reflecting coating to provide thermal insulation.

Applications

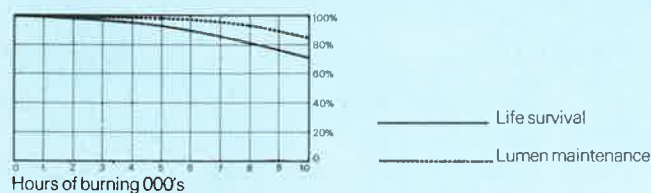
High-efficiency road lighting. Also floodlighting.

Operating position

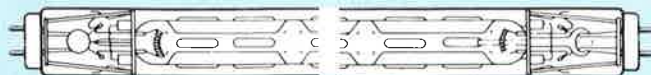
Horizontal $\pm 20^\circ$. 35W and 55W ratings may also be operated in the vertical cap up position.

Range

Lamp reference	Nominal lamp voltage	Lamp current amps	Cap	Lumens at 2000 hrs	Standard pack
35W SOX	70	0.6	BC	4300	9
55W SOX	109	0.59	BC	7500	9
90W SOX	112	0.94	BC	12500	9
135W SOX	164	0.96	BC	21500	9



Linear SLI/H sodium lamps



Dimensions
See p7

Description

Low pressure sodium discharge operating in a linear arc tube enclosed in an evacuated tubular outer bulb which has an internal infra-red reflecting coating to provide thermal insulation.

Application

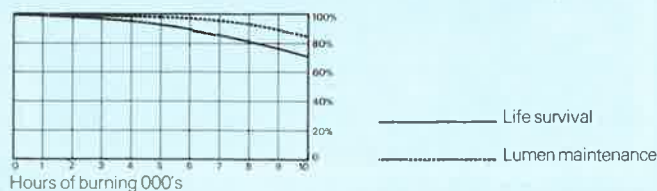
Streetlighting. Lamps comply with DoE requirements for principal and trunk roads, and motorways. Also floodlighting.

Operating position

Horizontal $\pm 20^\circ$.

Range

Lamp reference	Nominal lamp voltage	Lamp current amps	Cap	Lumens at 2000 hrs	Standard pack
140W SLI/H	175	0.9	Bi-pin	20000	25
200W SLI/H	145	1.6	Bi-pin	25000	25
200W (HO) SLI/H	145	1.6	Bi-pin	27500	25



Thorn SOX in unusual surroundings. The photo-engraving department of William Collins in Glasgow.

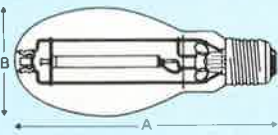
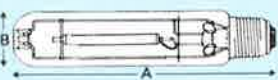

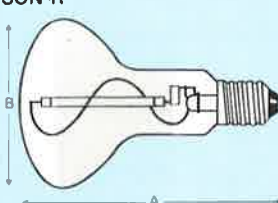
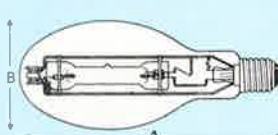
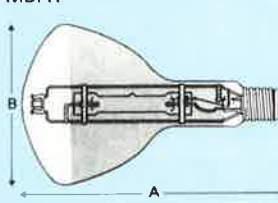
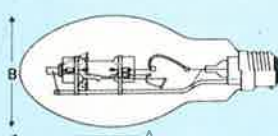
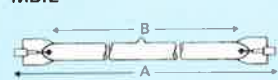
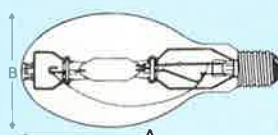

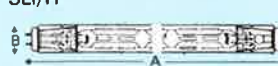
The sodium lamps' high efficiency and monochromatic output provided the required lighting level and a light which allowed the sensitive plates for engraving processes to be used without fogging.



M1 motorway lit by 200W (HO) SLI/H in Thorn Alpha Six Lanterns.

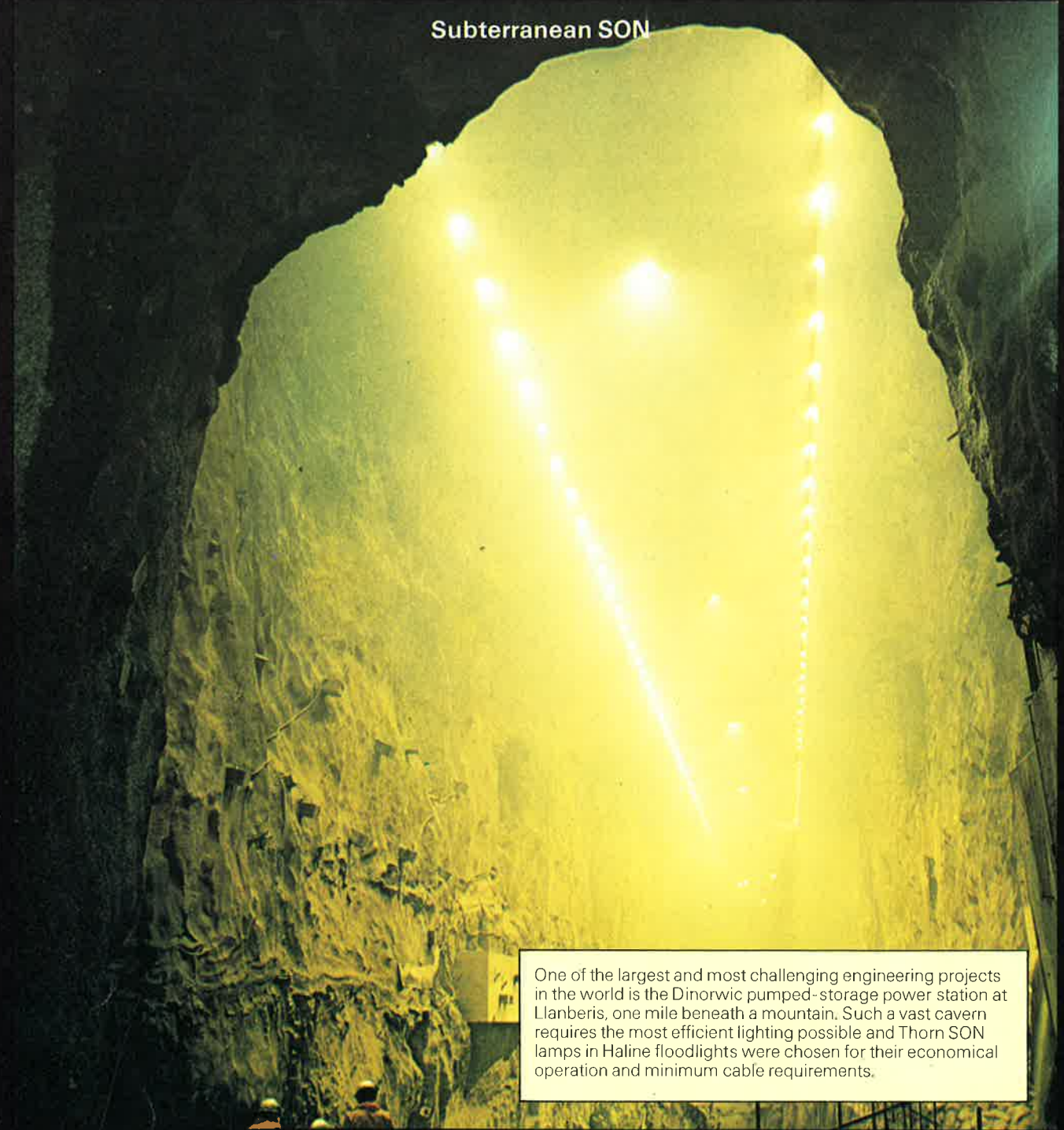


Lamp descriptions and applications

Lamp type	Dimensions mm		Wattage range	Colour appearance	Colour rendering	Efficacy range lumens* per watt	Indoor lighting	Outdoor lighting
	A	B						
SON 	154 227 227 286 410	71 91 91 122 167	70 150 250 400 1000	Warm	Acceptable	60-100	High-bay areas factories warehouses sports centres	Area lighting, roadways
SON-T 	256 286	53 53	250 400	Warm	Acceptable	97-107	High-bay areas factories warehouses	Area lighting roadways
SON-TD 	189+ 254+	24+ 24+	250 400	Warm	Acceptable	90-105	High-bay areas factories	Area and floodlighting
SON-R 	138	96	70	Warm	Acceptable	57	Foyers offices shop display	
MBF 	129 154 175 227 286 328 410	56 71 76 91 122 143 167	50 80 125 250 400 700 1000	Intermediate	Fair	30-54	High-bay areas factories shops offices	Area lighting roadways
MBFR 	260 300 328 380	166 181 202 221	250 400 700 1000	Intermediate	Fair	39-45	High-bay areas with dirt-laden atmospheres	
MBTF 	175 227 286	76 91 122	160 250 500	Intermediate	Fair	16-23	Areas for direct replacement from GLS	Areas for direct replacement from GLS
MBIL 	190±2 190±2	254±2 254±2	750 1500	Intermediate	Good	69		Floodlighting, sports arenas
MBIF 	227 286 410	91 122 167	250 400 1000	Intermediate	Good	56-78	High-bay areas factories retail stores offices	Area lighting
SOX 	311 425 528 775	53 53 67 67	35 55 90 135	Yellow	Mono- chromatic	75-116		Roadways, industrial area lighting
SLI/H 	909 909 909	39.5 39.5 39.5	140 200 200HO	Yellow	Mono chromatic	125-139		Major traffic routes

*Lumens at 2000 hours per circuit watt
+Nominal dimensions

Subterranean SON



One of the largest and most challenging engineering projects in the world is the Dinorwic pumped-storage power station at Llanberis, one mile beneath a mountain. Such a vast cavern requires the most efficient lighting possible and Thorn SON lamps in Haline floodlights were chosen for their economical operation and minimum cable requirements.

For more detailed information on discharge lighting please consult your nearest Thorn Lighting office.

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Telex 263201 TEIEnf G

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Design: Cope & Davies Limited

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