



A.E.I. LAMP & LIGHTING CO. LTD

SfB (63)

UDC 621.32

# HIGH PRESSURE FLUORESCENT MERCURY DISCHARGE TYPE MBFR/U

## GENERAL DESCRIPTION

Mercury Vapour Discharge lamp with Quartz arc tube loaded below 100 watt/cm of arc length and operating at a pressure of 8-10 atmospheres.

The Quartz arc tube is mounted in a bulb having a contour designed to give the required polar distribution. The crown is internally frosted to reduce glare.

The reflector material is coated with a fluorescent phosphor which converts some of the ultra-violet radiation of the mercury discharge into visible light. This does not affect the overall luminous efficiency of the lamp but by increasing the level of radiation at the visible spectrum it modifies the characteristic colour of the mercury discharge.

Colour appearance is similar to a daylight fluorescent tube and colour rendering is improved to the point where it is possible to distinguish colours acceptably.

The reflective coating of titanium dioxide permits some light to be transmitted through the upper part of the bulb also so that there is no harsh 'cut-off' at the crown of the lamp. This feature reduces glare to a minimum when the lamp is viewed from an angle.

As the reflecting surface is inside the glass envelope it is not affected by accumulated dust so that the maintenance of light on the working surface particularly in dirty atmospheres is materially better than a standard lamp and fitting.

The outer bulb is hard glass and suitable for use in exposed conditions. A new capping technique is employed whereby the glass is formed to the same shape as the cap thread. The cap is screwed on and locked without the use of conventional capping cement and eliminates any possibility of the lamp becoming detached from the cap during life.

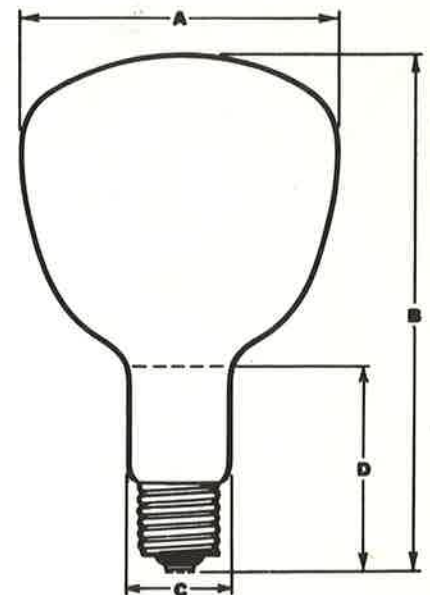
The lamp is designed for operation in any burning position in conjunction with standard control gear.

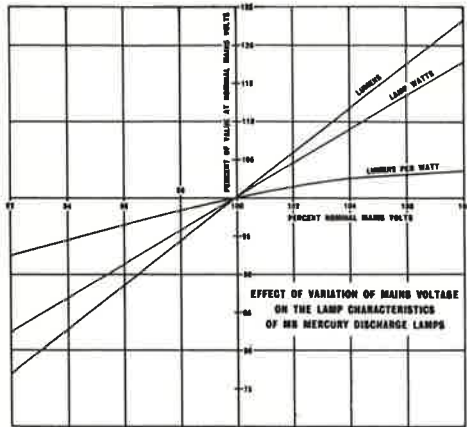
## APPLICATION

Medium and high bay industrial lighting. Floodlighting.

## STANDARD RATINGS

Watts	Volts	Cap	Type	Bulb	Rated Life (hours)	AEI L. & L. Ref. No.
250						91-2999
400	200/250	GES (E40/45)	MBFR/U	Reflector Fluorescent	5000	91-3009
700						91-3059
1000						91-3069





**DIMENSIONS (in mm)**

Watts	Cap	Diameter A	OAL B	Max. Neck dia. C	Min. Neck Length D
250	GES	130 ±	220 ± 7	52	95
400	GES	165 ± 2	280 ± 6	52	104
700	GES	200 ± 2	320 ± 8	54.5	115
1000	GES	236 ± 2	400 ± 10	54.5	118

**Light Output – Average through life**

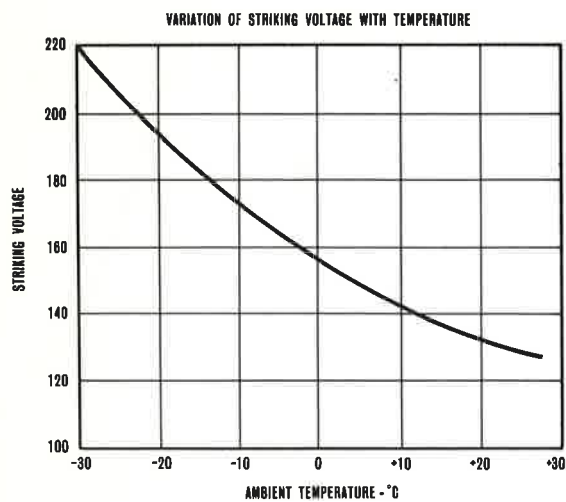
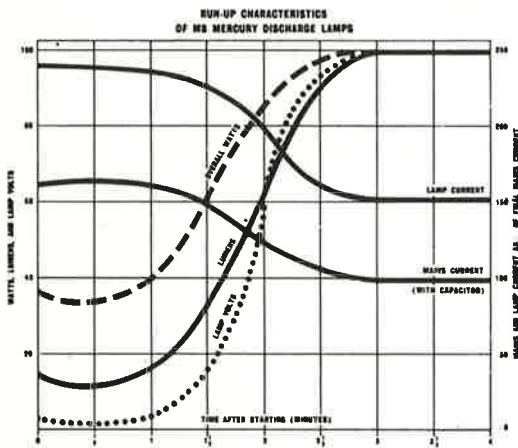
Watts	Lumens
250	9,500
400	16,600
700	30,000
1000	42,000

Red Ratio 6% (minimum).

Run-up time 3-5 minutes (approx.).

**Percentage luminance in spectral bands**

Band	Waveband (micron)	Colour	% Luminance (approx.)
1	0.38 – 0.42	Far Violet	0.01
2	0.42 – 0.44	Violet	0.4
3	0.44 – 0.46	Blue	0.05
4	0.46 – 0.51	Blue Green	0.8
5	0.51 – 0.56	Green	46.0
6	0.56 – 0.61	Yellow	45.5
7	0.62 – 0.66	Light Red	6.0
8	0.66 – 0.76	Dark Red	0.5



## OPERATING CONDITIONS

This lamp will operate satisfactorily in any position. In the event of the lamp being extinguished by an interruption in the supply, a short delay will occur while the lamp cools down, restrikes and runs up again.

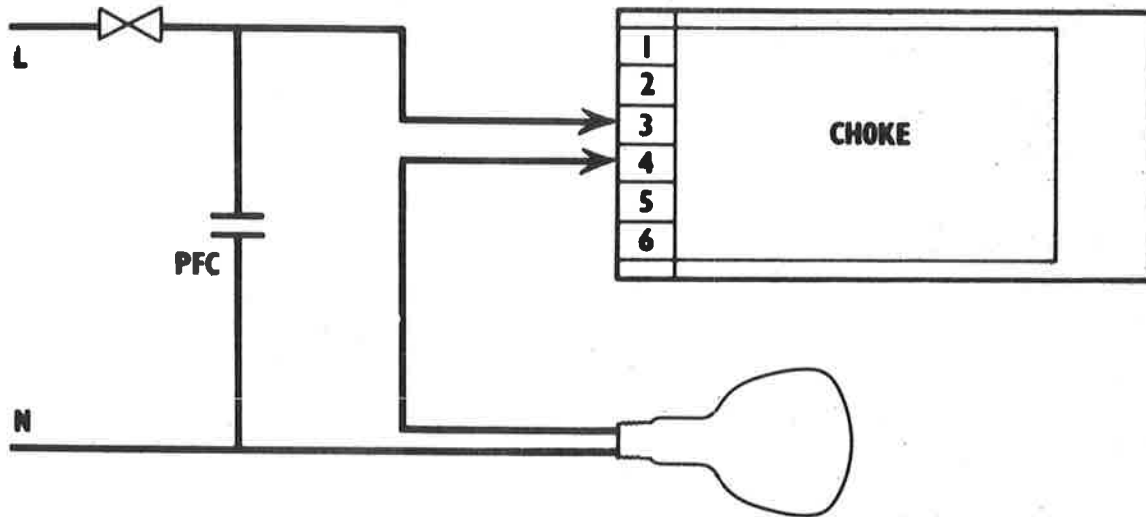
## WARNING

Should the bulb be broken and the arc tube continue to glow, the lamp should not be used, as without the protection of the bulb the radiations from the arc tube are harmful to the eyes and skin.

## CIRCUIT AND CONTROL GEAR

The MBFR/U type lamp is to be used with appropriate control gear. On a.c. 50-cycle circuits this takes the form of a choke connected in series with the lamp and also a capacitor for the power factor correction, connected across the supply leads, as shown in the circuit diagram.

Further details of approved control gear are given in data sheet G6



## NOTE

In the 1kW circuit two chokes are connected in parallel.

## BRITISH STANDARDS

Lamps described in this leaflet conform to the following standards where applicable.

BS 3677:1963 – Schedule of Fluorescent Mercury Discharge Lamps.

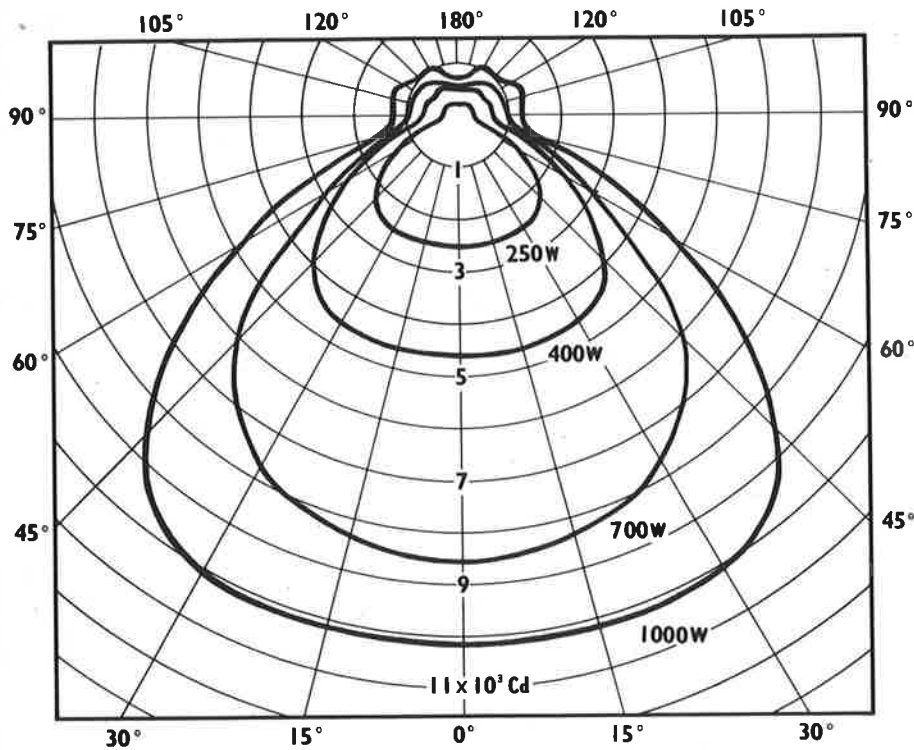
BS 98:1962 – Screw caps and holders.

## ELECTRICAL CHARACTERISTICS

Rating		Lamp Operating Volts	Nominal Lamp Operating Current (amps)	Starting Current (amps)
Watts	Volts			
250	200/250	115/145	2.15	4.0 – 3.0
400	200/250	120/150	3.25	7.0 – 5.0
700	200/250	125/155	5.6	10.0 – 7.0
1000	200/250	130/160	7.5	15.0 – 8.0

Note: The starting current values given above represent the short circuit current at nominal supply voltage of the standard choke used to operate the lamp. Circuits of this type have an inherent lagging power factor and therefore a capacitor is required as given in the circuit and control gear instructions. The incorporation of power factor correction capacitors in the lamp circuit result in the starting current values being lowered.

**Striking Voltage** – See graph.



### LIGHTING DATA

Total Light Output Ratio	100%
Light Output Ratio	up 20% down 80%
Luminous Area	250W – 21 sq. in. 400W – 33 sq. in. 700W – 48 sq. in. 1000W – 68 sq. in.
B.Z. Classification	B.Z.5
Spacing : Mounting Height Ratio	1.5:1

### COEFFICIENTS OF UTILISATION

Floor Reflection Factor 10%

Effective Ceiling Reflection	Re	70%			50%			30%	
		50%	30%	10%	50%	30%	10%	30%	10%
ROOM INDEX	0.6	0.39	0.32	0.28	0.37	0.31	0.27	0.30	0.27
	0.8	0.50	0.44	0.39	0.48	0.42	0.37	0.40	0.36
	1.0	0.57	0.51	0.45	0.54	0.48	0.43	0.46	0.42
	1.25	0.65	0.57	0.53	0.61	0.55	0.50	0.52	0.48
	1.5	0.69	0.62	0.57	0.64	0.58	0.55	0.56	0.51
	2.0	0.76	0.69	0.64	0.70	0.65	0.62	0.61	0.58
	2.5	0.81	0.75	0.70	0.75	0.70	0.66	0.66	0.62
	3.0	0.82	0.78	0.74	0.78	0.73	0.70	0.69	0.65
	4.0	0.86	0.83	0.79	0.80	0.78	0.74	0.72	0.70
	5.0	0.88	0.86	0.81	0.82	0.80	0.78	0.74	0.73

N.B.: All figures based on an ambient temperature of 25°C.