

Mazda

SfB (63)

UDC 621-32

EXTRA-HIGH PRESSURE DISCHARGE PROJECTION

MERCURY DISCHARGE

TYPE ME/D-250W

GENERAL DESCRIPTION

Mercury vapour discharge lamps with quartz arc tubes loaded above 100 watts/cm of arc length and operating at a pressure of about 30 atmospheres.

The arc operates between solid tungsten electrodes contained in the quartz bulb and provides a compact stable light source of high brightness. The radiations have much photochemical value and little heating effect. The same basic lamp is manufactured with different casings and bases, the three main variations taking the following forms:

1. A robust rectangular metal case with a glass or quartz window on a standard 5 amp 3-pin base.
2. A tubular glass envelope on a standard 5 amp 3-pin base.
3. An oval metal case with two opposing, uncovered apertures and a medium prefocus cap.

The supply may be either a.c. or d.c. and control gear is required.

GENERAL APPLICATIONS

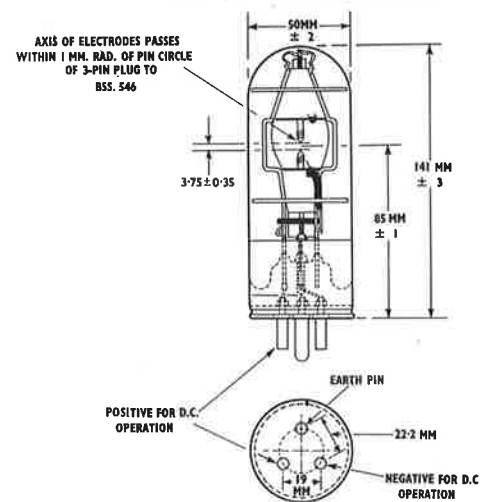
For use in monochrome slide and film projection, in film printing, and in conjunction with projection microscopes and other specialised apparatus. These lamps are also of great use in a variety of industrial inspection procedures.

The lamp with the medium prefocus (P28/25) cap and oval metal case was designed to be interchangeable with certain Class A1 tungsten projector lamps.

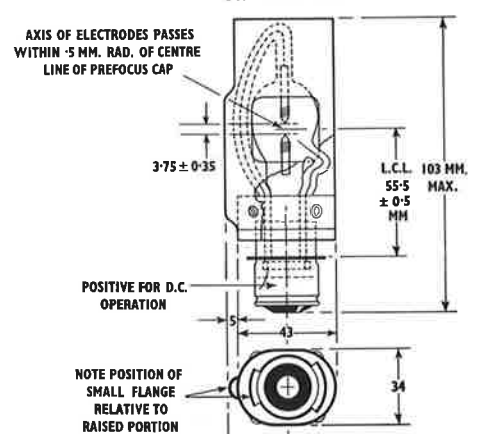
STANDARD RATING, TYPE, ETC.

Rating		Type	Outer casing and base
Watts	Volts		
250	200/250 a.c./d.c.	ME/D	Rectangular metal box – Glass window – 5 amp 3-pin base.
250	200/250 a.c./d.c.	ME/D	Rectangular metal box – Quartz window – 5 amp 3-pin base
250	200/250 a.c./d.c.	ME/D	Tubular glass envelope – 5 amp 3-pin base.
250	200/250 a.c./d.c.	ME/D	Oval metal case – Prefocus (P28/25) cap.

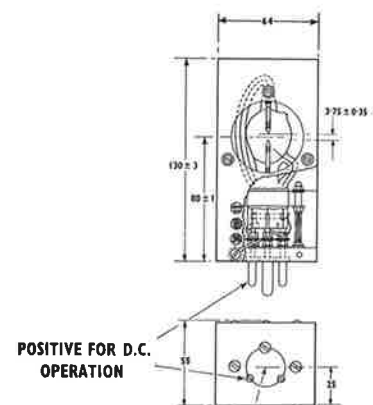
LAMP WITH TUBULAR GLASS ENVELOPE



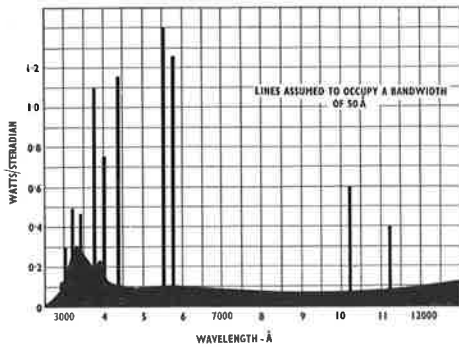
PREFOCUS LAMP



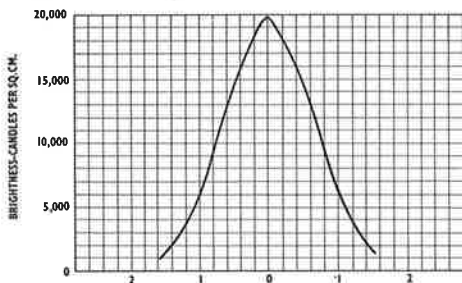
3-PIN BOX TYPE LAMP



SPECTRAL DISTRIBUTION



BRIGHTNESS DISTRIBUTION ACROSS CENTRE OF ARC

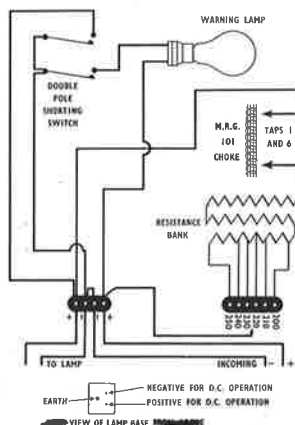


PHYSICAL CHARACTERISTICS

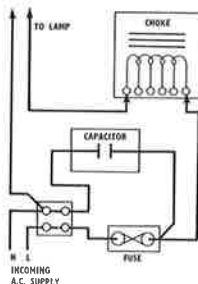
Casing	Base	Dimensions in mm		
		Diameter	Overall length	L.C.L.
Rectangular box	5 amp 3-pin	64 x 55	130±3.0 (excluding pins)	80±1.0 (excluding pins)
Glass envelope	5 amp 3-pin	50±2.0	141±3.0 (excluding pins)	85±1.0 (excluding pins)
Oval box	P28/25 (Med. PF)	43 x 34 with a 5mm projection on major axis opposite light centre	103 max. (from cap flange to far end of box)	55.5±0.5 (from cap flange)

NOTE: The 5 amp 3-pin base fits the corresponding socket specified in BS.546.
The P28/25 cap conforms to BS.1164.

D.C. OPERATION



A.C. OPERATION



ELECTRICAL CHARACTERISTICS

Rated watts:	250W
Supply volts:	200-250V a.c. or d.c.
Lamp operating volts:	60-75V
Lamp operating current:	3.7 to 4.6 amps
Starting current:	4.0 to 5.0 amps
Apparent lamp power factor:	0.9

LIGHT SOURCE CHARACTERISTICS AND PERFORMANCE

Source size in mm:	effective arc width: 1.5
	arc length: 3.75±0.35
Maximum initial brightness:	20,000 stilb
Mean horizontal candle power:	1,300 candelas
Average life:	500 hours

The light distribution of each of the three main variations of the lamp is shown in the polar curve diagrams.

The brightness distribution curve is measured *across* the arc at the centre of the arc length. The distribution *along* the arc is almost constant except in the regions adjacent to the electrodes.

The diagram of spectral distribution shows an appreciable level of continuous radiation with a number of line radiations, the strongest of which lie at 3650 Å (ultra-violet), 4046 Å and 4358 Å (blue), 5461 Å (green), and 5790 Å (yellow). It should be noted that the diagram illustrated shows the spectral distribution of radiation through the bare quartz tube. In those lamps fitted with glass envelopes or glass windows, the glass filters out progressively those radiations with wavelengths shorter than 3500 Å until there is virtually no transmission at wavelengths of 3000 Å and below.

OPERATING CONDITIONS

All these lamps must be operated in a vertical position, base downwards. A tilt of more than about 10° from the vertical will take convection currents of ionised gas against the walls of the quartz bulb with damaging effect.

During the first 10 minutes of operation the light output gradually increases as the lamp warms up. In the event of the lamp being extinguished by an interruption in the supply, a delay of some 10 to 15 minutes will occur while the lamp cools down, restrikes and runs up again.

The prefocus oval box lamp and the type fitted with the tubular glass envelope should be operated in some form of housing, sufficient to afford protection should the bulb for any reason burst. This precaution is not necessary with the 3-pin rectangular box type.

WARNING

It is a characteristic of mercury discharge that it radiates short-wave ultra-violet light. These radiations are harmful to human eyes and skin and are readily transmitted through quartz, though they are absorbed by most kinds of glass. Hence, while the radiations from ME type lamps with glass envelopes or glass windows are quite harmless, in operating the rectangular box lamp with a quartz window or the prefocus lamp with an oval metal case and unglazed apertures, precautions must be taken to shield people from either direct or reflected short-wave ultra-violet radiation.

CIRCUITS AND CONTROL GEAR

The 250 watt ME/D lamp is to be used in connection with the appropriate control gear, as detailed below.

A.C. OPERATION

On 190-260V alternating current supplies, the lamp must be operated in series with a choke, while a capacitor for the correction of power factor should be connected across the supply leads, as shown in the a.c. circuit diagram.

Supply voltage	Choke	Capacitor		
		Cat. No.	Capacitance	Volts wkg.
190-260V	MR 583	C 82604	60 μ F	260

Minimum power factor correction 0.85

Before placing the MR 583 choke in service the tapings should be adjusted to the supply voltage, as shown below:

A.c. 50-cycle	190V	200V	210V	220V	230V	240V	250V	260V
Tappings	2-4	1-4	3-5	2-5	1-5	3-6	2-6	1-6

Approximate a.c. circuit power consumption 285 watts

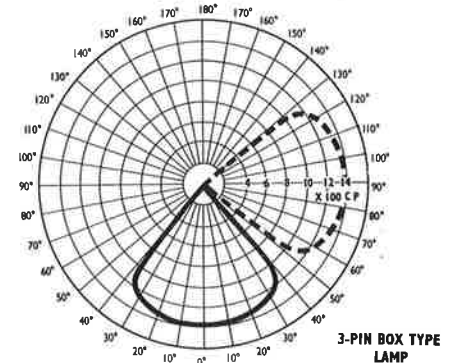
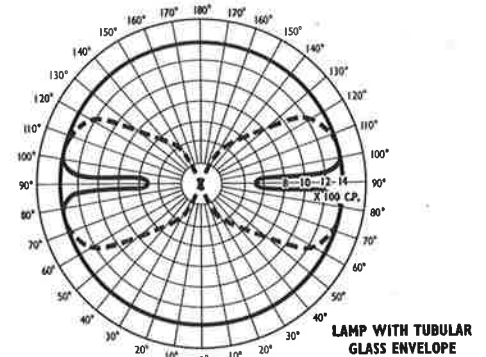
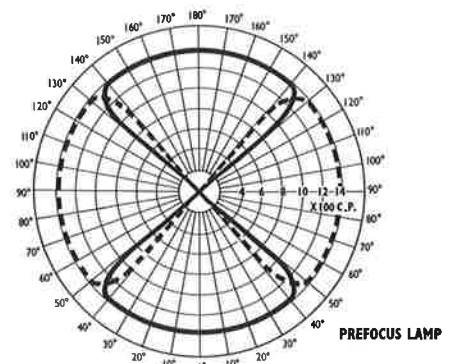
D.C. OPERATION

On d.c. supplies, the 250W ME/D lamp should be operated in connection with an ohmic resistor and a choke. The resistor is the main ballast, the choke being retained for starting purposes.

Details of resistance values and choke are as follows:

Supply Volts	Resistance value in ohms, $\pm 5\%$	Choke MR 583
200	35.2	Taps 1-6
210	37.9	Taps 1-6
220	40.6	Taps 1-6
230	43.3	Taps 1-6
240	46.0	Taps 1-6
250	48.7	Taps 1-6

POLAR CURVES OF LIGHT DISTRIBUTION



— DISTRIBUTION IN HORIZONTAL PLANE THROUGH CENTRE OF LAMP
 - - - DISTRIBUTION IN VERTICAL PLANE 0°-180° THROUGH AXIS OF LAMP