Mazda LAMP DATA SHEET

Mercury Discharge
Low Pressure
Type M

Mazda M. 1 and M. 2 Mercury Discharge Tubes have been developed to meet the demand for a small source of both ultra-violet and visible radiation and are especially useful where a mercury discharge source of small physical dimensions is required.

The original M. 1 model, for operation from a 24V d. c. supply, was designed as a means of exciting fluorescent details on instrument panels at low illumination levels.

Some of the many applications for which the Mazda M. 1 or M. 2 Tubes have found favour include time markers in recording camera equipment, as a source of the well-known mercury green line in laboratory instruments, for exciting a wide range of fluorescent materials and for various biological and entomological purposes, as for example the light source in an insect trap.

CHARACTERISTICS OF M.1 TUBE

Arc Wattage (at 0. 75 amps.) 4. 5

Minimum operating voltage 22

Filament heating current (amps.) 0. 8

Maximum filament heating current

(amps.) 0. 95

Maximum arc current (amps.) 0. 75

Objective life (hours) 200

*Cap SBC(B. 15d/17)

Operating position - Any

*Cap Connections : Sole plates to filament heater and shell of cap to anode

CHARACTERISTICS OF M.2 TUBE

Arc Wattage (at 0. 75 amps.) 4. 5

Operating voltage A.C. 200 - 250

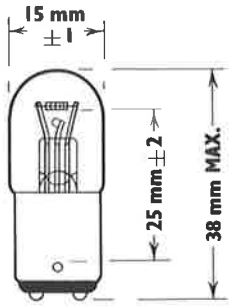
Operating current (amps.) 0. 5 - 1. 5

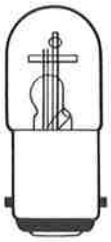
Objective life (hours) 200

Cap SBC(B. 15d/17)

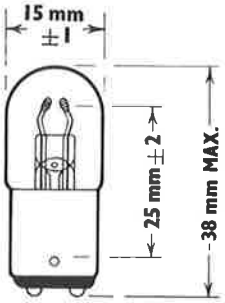
Operating position - Any

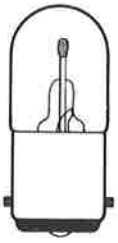
MERCURY DISCHARGE TUBE M.1





MERCURY DISCHARGE TUBE M.2





SCALE : FULL SIZE. All dimensions in m.m.

A.E.I. Lamp and Lighting Co. Ltd.
Melton Road, Leicester

98-900
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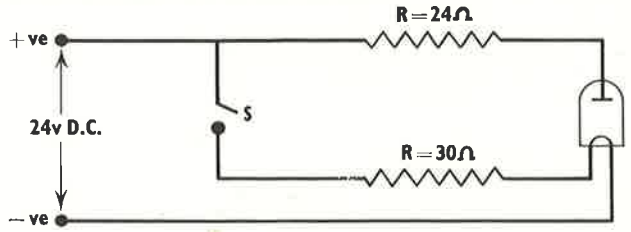
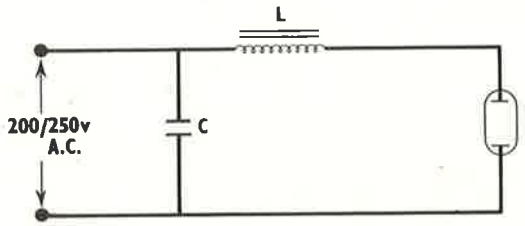
OPERATING CIRCUIT FOR M.1 TUBE

The cathode heater filament is used for initiating the arc and should be switched off once the arc has formed.



OPERATING CIRCUIT FOR M.2 TUBE



The current in the circuit of the M.2 Tube may be conveniently controlled by a choke L as shown in the circuit diagram. The inductance of the choke may be taken as :-

$\frac{1}{2\pi f}\left(\frac{\text{Mains Voltage}}{\text{Arc Current}}\right)$ Henries, where 'f' is the mains frequency.

For example, if the mains supply is 240V 50 c.p.s. and the tube is operated at 1.5 amps., then the choke required should have an inductance of :-

$\frac{240}{314 \times 1.5}$ i.e., 0.51 Henries.

If required, the power factor of the circuit may be improved in the normal manner by including a capacitor, C, as shown. Thus, taking the example quoted above, where the tube is operated at 1.5 amps. from a 240V, 50 c.p.s. supply, the value of the capacitor required to raise the power factor to 0.85 would be 20μF.

As an alternative, the choke may be replaced by a resistance to give the required current control, the value of the resistance being given by :-

$\left(\frac{\text{Mains Voltage}}{\text{Arc Current}}\right)$ Ohms.

SPECTRAL ENERGY DISTRIBUTION

The spectrum of both the M.1 and M.2 Tubes can be taken as that of a low pressure discharge in mercury with an appreciable amount of energy at 3,650 Å, the envelope cut off being at about 3,000 Å. When the filament heater of the M.1 Tube is switched on an additional amount of continum is introduced, this additional energy being indicated by the dotted lines in the diagram.

APPROXIMATE SPECTRAL ENERGY DISTRIBUTION FOR M.1 AND M.2 MAZDA MERCURY DISCHARGE TUBES

(Principle mercury lines shown as 100°A wide.)