

General description

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The 400 watt Compact Source Iodide lamp is a new design of projector lamp giving white light of good colour rendering properties at an efficiency of 80 L/W for 100 hours. The source size is approximately 9mm × 5mm and the brightness is about 8000 candelas per square cm.

The high efficiency is obtained by the use of an arc discharge. The iodide technique has been used to introduce additional elements into the arc and to keep the bulb wall clean throughout life. Careful choice of the number and quantity of

these additional elements and of the loading conditions has resulted in a balanced spectral distribution which is virtually a continuum with a few widely spaced narrow absorption lines. In practical user terms this means that the light is white and the colour rendering is good.

The lamp is somewhat unconventional in appearance. It is extremely rugged. The small total physical size and the ability to operate it in any position ensures that the lamp can be readily fitted into existing equipment and simplifies the design of new equipment. The single ended construction and the degree of refocusing provided means that lamp replacement is straight-forward.

Applications

The major advantage of this lamp is its high efficiency, combined with its robustness, simplicity, small size and relatively low power consumption.

In general, considerations of source size, lamp size, lamp rating and efficiency indicates that it can be used in applications which at present use 100V-240V hard glass filament projector lamps of 250W-1000W rating to give a substantial advantage in terms of either increased light output or a reduction in input power and heat. In a number of cases it should prove a useful replacement for the 250W M.E. lamp and the 500W and 2kW Xenon lamps. In the latter case the main advantage will be in the major reduction in cost and complexity of control gear.

The demand will be in such fields as high power slide projectors and theatre spotlights, and in the rapidly expanding market for overhead projectors. The higher screen brightnesses which can now be achieved means that the projection of colour pictures which are clearly visible in subdued daylight is feasible. Other uses are in projection microscopes, colour printing, diazo printing, enlarging and cine projectors.

In addition, the increased performance now available may well extend the application of projection techniques.

Characteristics

Lamp characteristics are shown on the first page. The colour appearance is given in terms

of the chromaticity co-ordinates of the C.I.E. colour chart as colour temperature is not considered a satisfactory method of defining either colour appearance or colour rendering for non Planckian radiators. The colour rendering properties can be assessed from the spectral power distribution diagram (Fig. 1). (Note: The approximate colour temperature of the lamp is of the order of 3200°K but, as indicated, this figure must be used with extreme caution.)

The candle power distribution is roughly symmetrical in the horizontal plane and an approximate figure for the candle power in any direction can be obtained from the curves shown in Fig. 2. The brightness distribution is shown in block form (Fig. 3) to assist calculation of useful areas for different applications. For example, it may be shown that approximately 80% of the light comes from an area 9mm × 5mm. It should also be noted that the arc is partially transparent to its own radiation and its image can be superimposed to give a more square and uniform distribution. Effective gains of up to 40% can be obtained in this way.

FIG. 1

Typical Spectral Power Histogram
for the 400W Compact Source Iodide Lamp

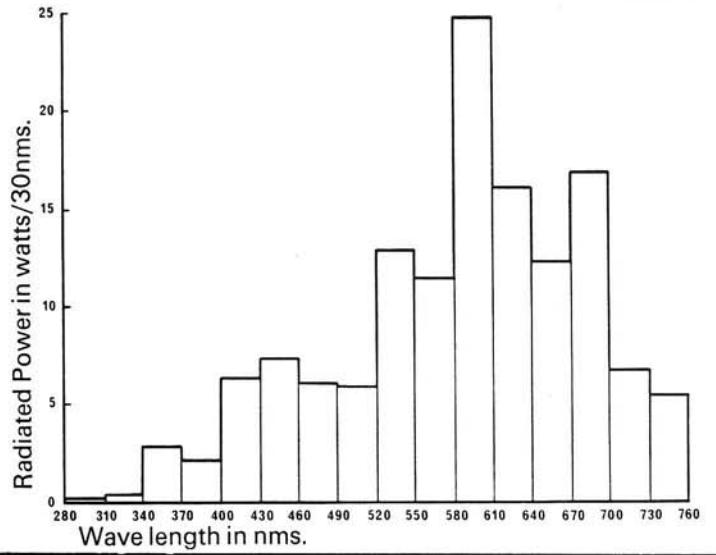


FIG. 2

Typical Candlepower Distribution
in vertical planes
A—through electrodes.
B—normal to electrodes.

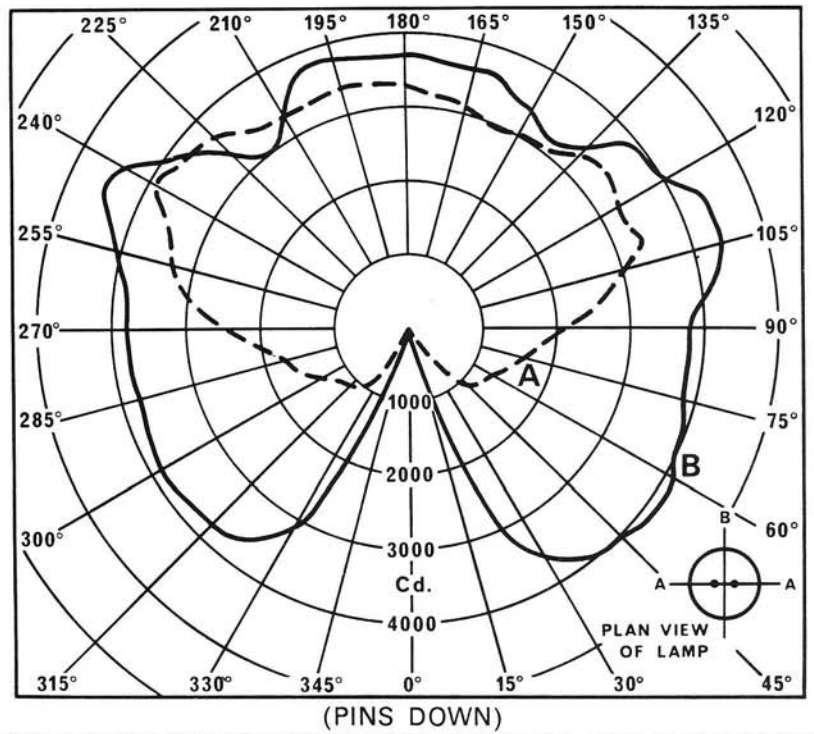


FIG. 3

Typical Brightness.
Distribution Diagram.

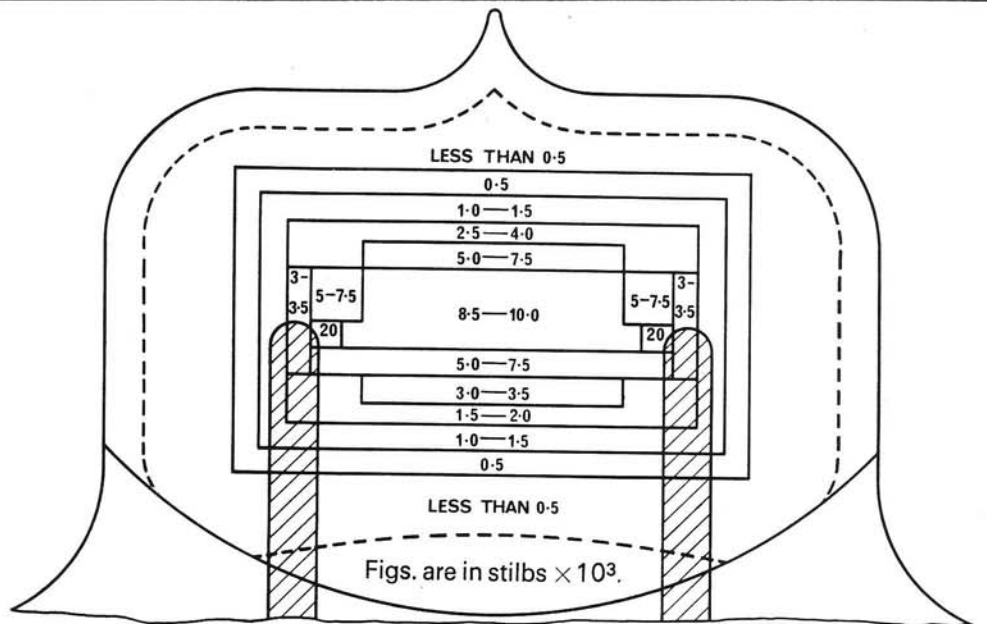
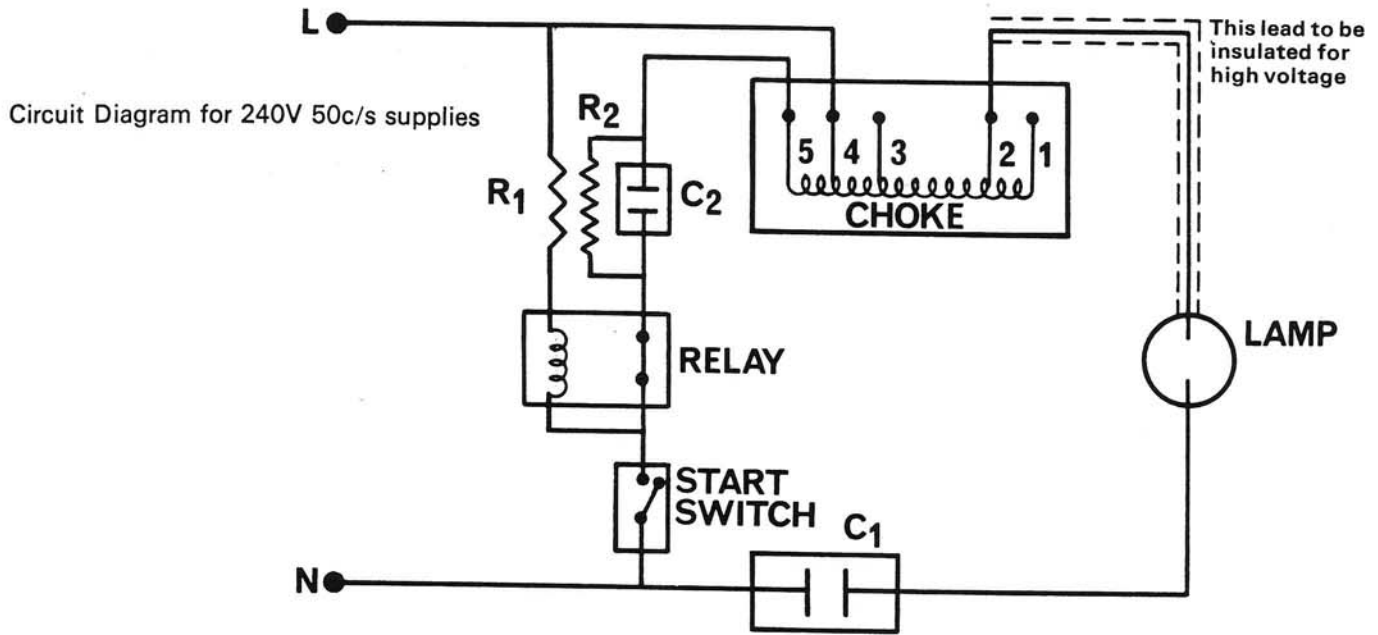


FIG. 4



Control gear

The lamp requires a series impedance to limit the current and some form of pulse starter to initiate the arc. The pulse voltage required is 8kV. A recommended circuit to operate the lamp is shown in Fig. 4. The series capacitor shown is needed if the mains falls much below 240V.

Components of circuit

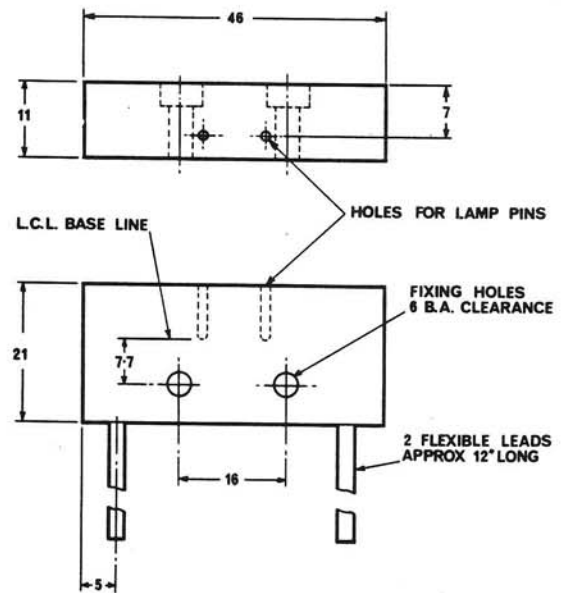
- Choke B.L.I. Cat. No. AME53189.4
- Capacitor C1 B.I.C.C. 35mfds \pm 5% 440 Volt A.C. (3 \times 11.7mfds)
- Capacitor C2 Hunts 1 mfd 600V D.C. Cat. No. ZG717
- Relay Magnetic Devices SERIES 325. Ref. TS14084
- Switch Bulgin Biased Toggle Cat. No. S796
- Resistor R1 4700 ohms 1 watt
- Resistor R2 4700 ohms 10 watt.

Lampholder

A lampholder (B.L.I. Cat. No. L1101) has been designed for use with the lamp. An outline drawing showing fixing dimensions is shown in Fig. 5.

FIG. 5

Lampholder ref: L.1101 for use with the 400 watt Compact Source Iodide lamp.



All dimensions in mm unless otherwise stated.