

COMPACT SOURCE MERCURY PROJECTOR LAMPS

99-101

September 1972

Replaces August 1972

ELECTRICAL CHARACTERISTICS

Supply Volts AC	240V
Arc Watts	400w
Arc Volts	100V
Arc Current	5A
Run up Time	30 secs.
Re-starting Time	3/5 mins.

Dimensional Diagram

PHYSICAL DIMENSIONS

Arc Length	9 ± 1.0 mm.
Arc Size	9×5 mm.
Overall Length (max.)	55 mm.
L.C.L.	34 ± 1 mm.
Diameter (max.)	30 mm.
Pin Length (min.)	8.5 mm.
Pin Spacing	9.0 ± 0.5 mm.
Pin Diameter	.76 mm.

LUMINOUS CHARACTERISTICS

Initial Lum Eff (min.)	80 lumens/watt
Lumen maintenance	90%
Colour Rendering	Good
Chromaticity Co-ordinates	$x = .433, y = .382$

LIFE (nominal objective) 500 hours

Operating position Any

GENERAL DESCRIPTION

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 9 mm. x 5 mm. 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.

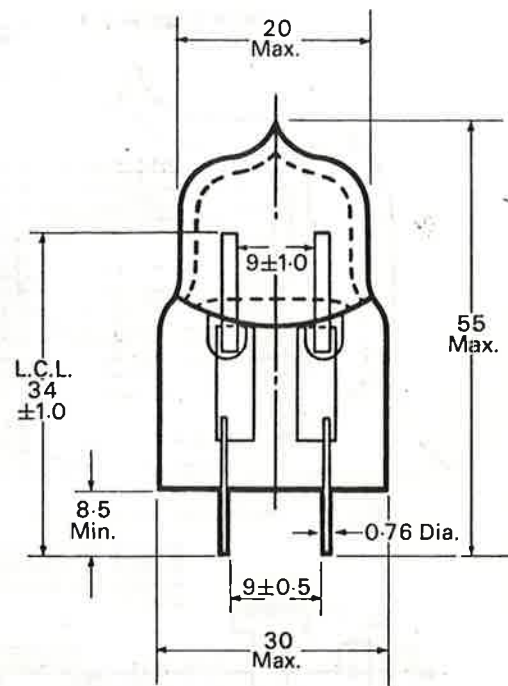
The lamp is somewhat unconventional in appearance. It is extremely rugged. The small total physical size and the ability to operate it in any position ensures that the lamp can be readily fitted into existing equipment and simplifies the design of new equipment. The single ended construction and the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

ADVANTAGES

- 1) The major advantage of this lamp is its high efficiency, combined with its robustness, simplicity, small size and relatively low power consumption.
- 2) Increased light output or reduction in input power and heat. The lamp can be used in applications which at present use 100V - 240V hard glass filament projector lamps of 250w - 1000w rating.
- 3) Major reduction in cost and complexity of control gear.
- 4) The higher screen brightness which can now be achieved means that the projection of colour pictures which are clearly visible in subdued daylight is feasible.
- 5) The increased performance now available may well extend the application of projection techniques.

USES

- 1) Considerations of source size, lamp size, lamp rating and efficiency indicates that it can be used in place of 100- 240V hard glass filament projector lamps of 250 - 1000w rating.
- 2) The demand will be in such fields as high power slide projectors and theatre spotlights, and in the rapidly expanding market for overhead projectors.
- 3) Other uses are in projection microscopes, colour printing, diazo printing, enlarging and cine projectors.
- 4) For photographic use it is suitable for use with daylight colour film stock.



The 400 watt Compact Source Iodide Lamp.

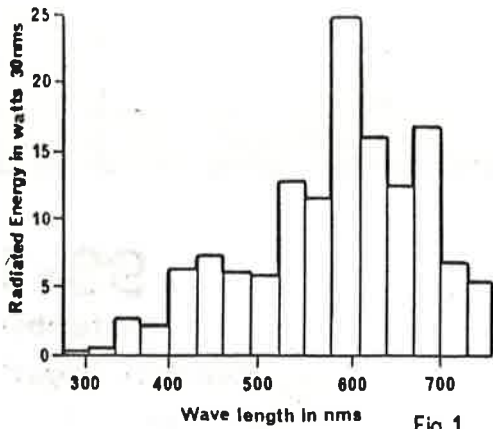


Fig. 1
Typical Spectral Power Histogram
for the 400W Compact Source Iodide Lamp

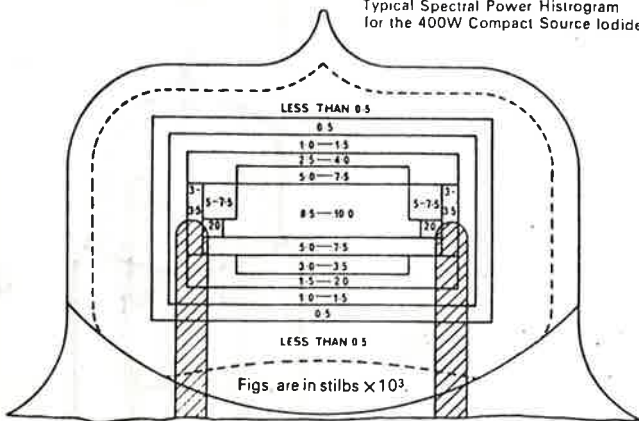
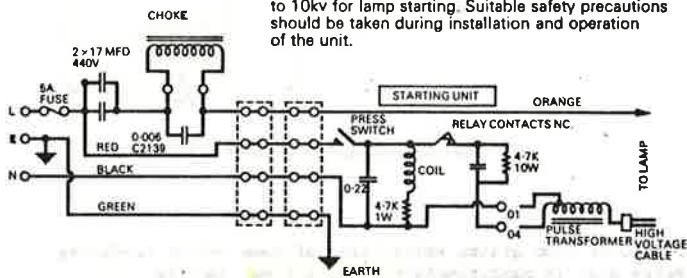


Fig. 3
Typical Brightness Distribution Diagram

Warning This unit generates high voltage pulses up to 10kv for lamp starting. Suitable safety precautions should be taken during installation and operation of the unit.



Circuit diagrams

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 of different applications. For example, it may be shown that approximately 80% of the light comes from an area 9mm. x 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.

CONTROL GEAR UNIT CAT. NO. AME 53196.4 FOR OPERATING 400 WATT MAZDA
C.S.I. COMPACT SOURCE MERCURY -IODIDE LAMP SUPPLY INPUT 240 VOLTS 50 HZ

1. The lamp connection from the high voltage terminal on the pulse transformer should be not longer than 6 ft. and suitable high tension cable should be used. (Duracable S11 - 16/012)
2. The starting unit is mounted on a detachable chassis, and may be removed and fixed separately if the 4 connecting wires are extended from the 4 way terminal block. This enables the starter unit to be mounted on the side of the lamp housing ensuring a short H.T. lead totally enclosed within the equipment for additional safety.
3. The case of the unit should be earthed.
4. The 240 volt 50 Hz supply should be connected to input terminal block marked 'L' and 'N'.
5. The input is fused with a 5 amp. fuse to BS. 1362. It can be removed by pulling the red carrier.
6. To start the lamp the side switch should be depressed for a few seconds until the lamp is burning steadily and then released. Do not operate switch whilst lamp is working.
7. It will be necessary to allow the lamp to cool before restarting.
8. **WARNING:**
The unit generates high voltage pulses for lamp starting. Suitable safety precautions should be taken during installation and operation of the unit.

The control unit and associated lamp house must be earthed. The H.V. cable should be protected from accidental damage. Disconnect supply before servicing. Lamp should always be totally enclosed.

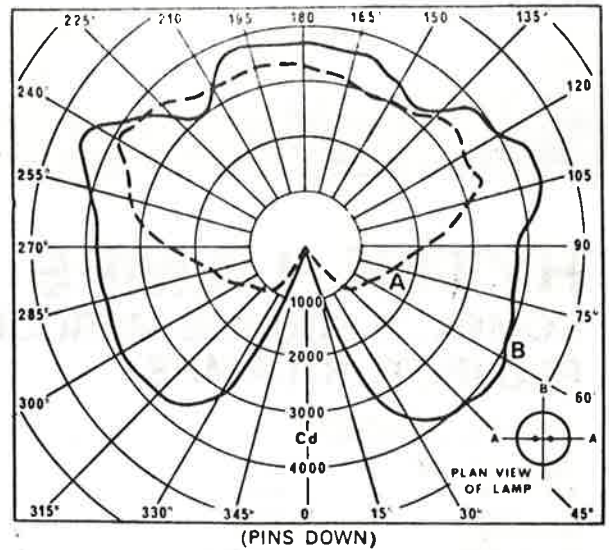
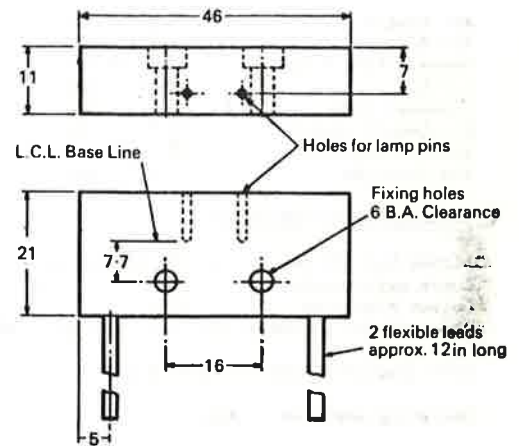


Fig. 2
Typical Candlepower Distribution in vertical planes.
A—through electrodes
B—normal to electrodes



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