ORIEL
CORPORATION

SHORT ARC LAMP
OPERATING PROCEDURES

10/5/90

Please read these instructions completely before operating this equipment.

If there are any questions or problems regarding the use of this equipment, please contact:

ORIEL CORPORATION
250 Long Beach Boulevard
Stratford, CT 06497-0872
Phone: (203) 377-8282
Fax: (203) 378-2457

- or -

ORIEL S.A.R.L.
9 Avenue De Laponie
Z.A. De Courtaboeuf
91951 Les Ulis Cedex
France
Phone: 01-69-07-20-20
Fax: 01-69-07-23-57

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1 Mole Business Park
P.O. Box 31
Leatherhead
Surrey KT22 7AU
England
Phone: 0372-378822
Fax: 0372-375-353

- or -

The representative from whom this equipment was purchased.

I

OPERATING INFORMATION

DO NOT HANDLE OR ATTEMPT TO OPERATE ANY ORIEL SHORT ARC LAMP UNTIL YOU ARE AWARE OF THE HAZARDS INVOLVED.

I.1 Explosion Hazard

The pressure inside all Oriel xenon and mercury(xenon) lamps is above atmospheric, even when the lamps are cold. When operating, the internal lamp pressure is several tens of atmospheres. Therefore:

1 Extreme care is necessary when handling and mounting a lamp.
2 The lamp should only be operated in a safe enclosure, such as an Oriel Lamp Housing.
3 The lamp should be mounted in a stress-free manner.

I.2 Handling a cold lamp:

For safety, use goggles and heavy gloves when handling a cold lamp. Avoid straining, or twisting the lamp in any way. Never touch a bare lamp with you hands for safety, and to prevent finger oils from being deposited on the lamp. Finger oils will etch the quartz envelope, particularly with UV irradiation. The weakened surface can rupture under the high stress levels in an operation. Prior to operation of the lamp, clean any oil or dirt off with alcohol. Do not touch the quartz envelope after cleaning.

I.3 Radiation (Light) Hazard

These arc lamps emit short wavelength ultraviolet radiation and intense visible and infrared radiation. Absorbed radiation (usually ultraviolet and infrared) can cause eye and skin burns and the hazards of ultraviolet light include corneal burns, skin burns and possible mutagenic effects. Therefore:

1 Operate the lamp in a manner which confines the radiation to the desired output beam.
2 If possible, filter the ultraviolet from the beam to reduce the hazard. If your application prevents ultraviolet beam confinement, then post appropriate warning signs and equip all exposed personnel with appropriate safety wear.

3 Never look into the output beam, at any reflection of the beam or at any surface irradiated by the beam without appropriate safety goggles. A "black" surface may be reflective in the ultraviolet or infrared.
4 Do not allow an intense, particularly focused, beam to fall on bare skin.
5 Do not allow any ultraviolet radiation to fall on unprotected eyes or skin.

I.4 Electrical Hazard

Transient high voltages are required to start arc lamps, typically 30 kV, and the power supplies provide high currents at moderate voltages. Therefore:

1 Ensure that the electrical connections to the lamp are safely enclosed and adequate for the voltages and currents to be used.
2 Exercise good electrical safety practice when working with any lamp-power supply combination. If possible, use interlocks to power down the supply if the lamp enclosure is opened.
3 Before changing lamps, make sure the power supply is fully discharged. Many arc lamp power supplies have filter or boost capacitors in the output state; allow time for these to fully discharge before accessing the lamp.

I.5 Ozone Hazard

Ultraviolet radiation produces ozone, a toxic gas with different physiological impact on individuals and various tolerance levels. Ozone is beneficial in the upper atmosphere but is a ground level pollutant. The American Industrial Hygiene Association publish the following industrial standards for maximum allowable concentrations:

0.1 ppm by volume for an 8 hour exposure
2 ppm for a 2 hour exposure

Local codes may be stricter. As a guide, 0.015 ppm is barely detectable by smell, and 1 ppm provides a very obnoxious odor. Ozone test kits are available from Oriel. Whatever the code, we do not recommend exposure to ozone. Therefore:

1 Use an ozone free lamp unless you require the very short wave ultraviolet.
2 Ensure adequate ozone removal by one or more of the following:

   a Operate in a well ventilated area (large volume).
   b Use an Oriel Ozone Eater™ for catalytic destruction of ozone from the lamp housing.
   c Vent the exhaust from the lamp housing, preferably to an ozone destruction system. If you do this, ensure that the lamp cooling is not adversely affected.

I.6 Lamp Cooling

Arc lamps operate at high internal pressures and temperatures. The envelope and terminals must operate within the design specifications. Terminal temperatures should not exceed 200 °C. The bulb should be uniformly cooled within a range that depends on the lamp type. Proper cooling will ensure the stress on the lamp envelope is that for which the bulb shape was designed. Additionally the operating parameters of mercury arc lamps are sensitive to envelope temperature. Over cooling of these lamps results in high current operation with low output and greatly shortened lamp life. Oriel Lamp Housings are designed for proper operation of these lamps.

I.7 Lamp Operating Orientation and Electrical Connections

All arc lamps should be operated vertically. For xenon and mercury(xenon) lamps the anode and therefore anode terminal (+ve) must be on top. For mercury lamps the anode and therefore anode terminal should be at the bottom. The +ve lead from the power supply must be connected to the anode.

II

WARRANTY

Oriel's Arc Lamp Warranty is on a pro-rata basis and covers lamps which are operated according to Oriel's instructions. Lamps which are operated incorrectly are not covered. The most common cause of lamp failure is incorrect polarity. Improper cooling, mounting which induces strain and operation of lamps with dirty bulbs are other major causes of premature failure.

We will replace the lamp if it fails within the first 10% of rated life (the average life quoted in the Oriel catalog). If a lamp fails after this initial 10% we will credit you for the unexpired lamp life on a proportional basis. E.g. If the lamp fails at 60% of rated life, we will credit you with 40% of purchase price. Please note that end of rated life is defined as total accumulated operating hours to 50% of initial luminous output. Fill out the attached form and return the lamp to Oriel in accordance with the Return Policy. No claims of any kind will be accepted or processed unless this form is filled out completely and returned with the merchandise in question or under separate cover.

III

RETURNS

Before returning equipment to Oriel for repair/replacement, please call the Customer Service Department. The phone number is (203) 377-8282. You will be given a Return Material Authorization (RMA) number. To save time, have the Purchase Order number used to purchase the equipment available before calling Oriel. Having this number will ensure that your equipment will be properly processed and greatly shorten the time required for the repair/replacement. Equipment returned without a Return Material Authorization (RMA) number may be rejected by the Oriel Receiving Department. Equipment returned under warranty will be returned with no charge for the repair/replacement or shipping.

Lamp Model No. _____ Serial No. _____
Purchased From _____ Date _____

Supporting Equipment:

a) Lamphouse Model _____ Mfg. by _____
b) Ignitor Model No. _____ Mfg. by _____
c) DC Power Supply Type _____
Model No. _____ Mfg. by _____

Operating Conditions:

Accumulated Running Hours _____
Duty Cycle _____ No. of Ignitions _____
Voltage _____ Current _____ Wattage _____
Lamp Axis (Horizontal or Vertical) _____
Cooling (Forced Air, Electrode Cooled) _____
Was the lamp operated in reverse polarity ☐ Y ☐ N
Conditions causing reject or return _____

Additional information _____

For enhanced (boost) current applications only:

Boost pulse duration _____
Boost pulse frequency _____ % Boost* _____

*% Boost = $\frac{i_{max} - i_{normal}}{i_{normal}} \times 100$

i_{max} and i_{normal} are instantaneous, not r.m.s. values.

Form completed by _____ Title _____
Company _____
Address _____
Phone No. _____ Fax No. _____ Date _____