

INDUSTRIAL MEMORASE® EPROM ERASER MODEL C-91 LD

Manufactured by



UVP

# OPERATING INSTRUCTION MANUAL

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# MEMORASE® INDUSTRIAL EPROM ERASER

## MODEL C-91LD

### 1. GENERAL DESCRIPTION

The Model C-91LD Industrial EPROM Eraser is designed to provide intense ultraviolet radiation for the erasure of Erasable Programmable Read Only Memory chips. It is capable of processing up to 96 EPROMS per operating cycle. The system is designed for ease of operation, safety, and long-lived maintenance free operation.

### SPECIFICATIONS

- A) Overall Size: 14" W x 13" D x 7" H  
(35.6cm x 33cm x 17.8 cm)
- B) Weight: Approximately 22 pounds  
(52.2 Kg)
- C) Electrical: 115VAC, 60Hz, 1.8 Amps  
(220/240V, 50Hz, .92 Amps)
- D) Primary Wavelength: C-91LD: 254nm
- E) Nominal Output: 15,000  $\mu\text{W}/\text{cm}^2$  at surface of EPROMS (1 inch (2.54cm) below lamp)
- F) 0 - 120 Minute Timer
- G) Non-Resetable Hour Meter
- H) Sliding tray with viewing ports and interlock to prevent accidental exposure.

### II. UNPACKING AND SET-UP

- A. Remove the tray assembly from between the two walls of the shipping cartons, and remove foam cover.
- B. Remove the unit from the inner carton and place it on a work table.
- C. Check the lamp, tray guides, timer, and the interlock switch on the drawer guide for shipping damage. Notify the carrier immediately if damage is observed, and make a proper damage claim.
- D. Insert the tray into the tray guides, observing that the conductive foam is facing upwards and push the tray closed.

E. Install the cabinet on a horizontal surface with proper electrical input service as described on the label. There must be a minimum of six (6) inches (15.2cm) clearance behind the unit for proper operation of the cooling fan.

CAUTION

DO NOT ATTEMPT TO OPERATE THE LAMP  
WITH THE INTERLOCK SWITCH DEFEATED. SHORT WAVE  
ULTRAVIOLET IS HARMFUL TO UNPROTECTED EYES AND SKIN.

DANGER HIGH VOLTAGE

F. Do not tamper with the lamp connections or ballast wiring. If damaged in transit, the lamp should be replaced by qualified personnel only (see section VIII.)

### III. OPERATION

A. Slide the tray out until it stops. The EPROM tray is designed to accept a foam pad (included) onto which a maximum of 96 EPROMS or one 8" x 10.2" circuit board can be loaded at one time.

NOTE: The cabinet does not have to be fully loaded to operate properly. However, the foam pad does deteriorate slowly with exposure to UV, so it is advisable to use as much of the pad as possible with each erasing operation.

NOTE: The use of foam pads other than that supplied is not recommended. The composition of the pad has been chosen to minimize decomposition upon UV exposure and prevent the buildup of static charges which can prevent erasure or even in some cases destroy the EPROMS.

B. Push the tray in completely. There is an interlock switch on the tray guides which will give a slight "click" when the tray is completely closed. Set the timer for the proper exposure. The unit will shut itself off after the designated time interval.

C. When the cabinet is operating, the cooling fan will be running to

stabilize the thermal environment in the cabinet. Operation of the UV lamp may be observed through the viewing ports on the front of the tray. These are equipped with special UV filters to insure that no harmful radiation emerges from the cabinet.

D If EPROMS are on circuit board, and board has no materials that may be damaged by short wave UV light, the entire board may be placed on the drawer in place of the foam pad.

NOTE: Limiting Board Dimensions:

8" x 10.2"  
1-1/8" Height

#### IV. EXPOSURE CONSIDERATION FOR EPROMS

A. The primary wavelength for erasure of EPROMs is 254nm (shortwave UV). In this cabinet, 254nm output is produced by a low pressure mercury vapor lamp. The nature of the lamp is as follows:

1. There is an optimum operating temperature for the 254nm output of the lamp.
2. To reach that temperature there is a warm-up time required. (See VI)
3. There is a gradual decline in 254nm output of the lamp over a period of time. This, as with any mercury vapor lamp, is accelerated with repeated on and off cycles. (See VI)
4. The output from a new lamp will normally vary  $\pm 10\%$  due to differences in materials and processing.

B. To summarize, the output of the lamp will vary with environmental changes, cycling on/off time and frequency, and age of the lamp. After the cabinet has warmed up, the key factor in computing exposure time is the age of the lamp.

The following data is intended for use as guidelines to determine proper exposure time.

1. UV radiation intensity produced at a distance of 1" (2.54cm) from a new lamp =  $15,000 \mu\text{W}/\text{cm}^2 \pm 10\%$ .
2. If the energy required to erase a particular EPROM is known, the minimum exposure time may be determined from the following relationship:

$$t = \frac{E}{(6 \times 10^{-5}) ie}$$

min

Where:

t = Exposure Time (min.)  
E = Erase Energy ( $\frac{\text{w-sec}}{\text{cm}^2}$ )  
@ 254nm Wavelength  
i = Light Intensity at  
Chip Surface ( $\mu\text{W}/\text{cm}^2$ )  
e = Lamp Efficiency  
(See Figure VI-A)

Example

One commonly used EPROM has an erase energy rating of 6 w-sec/cm<sup>2</sup>. The C-91LD lamp has been in use 500 hours, as determined by the cumulative hour meter.

Therefore:        E = 6  
                      i = 15000  
                      e = 80%

$$t = \frac{6}{(6 \times 10^{-5}) (15000) (.80)} = 8.3 \text{ Minutes}$$

Most users add approximately 10-20% more time as a safety margin, so the example chip would be run 9-10 minutes.

3. If the erase energy specification of a chip is unknown the following procedure may be used.
  - A. Expose a sample chip for 30 minutes.
  - B. Verify complete erasure.
  - C. Increase or decrease exposure times as required.
  - D. Periodically verify complete chip erasure.

NOTE: Many factors of EPROM chip construction, age, and processing materials affect erasure time. Increased exposure times may be required on older EPROMS.

VI. LAMP CHARACTERISTICS:

1. Aging characteristics of lamp.

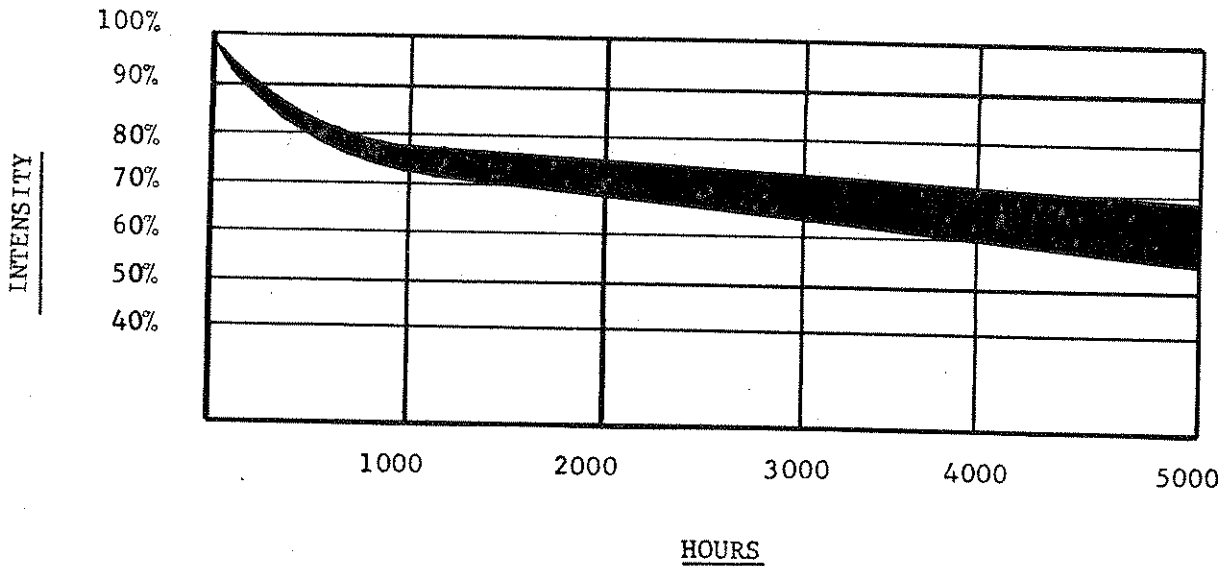


FIGURE VI-A

2. Warm up cycle and restart cycle

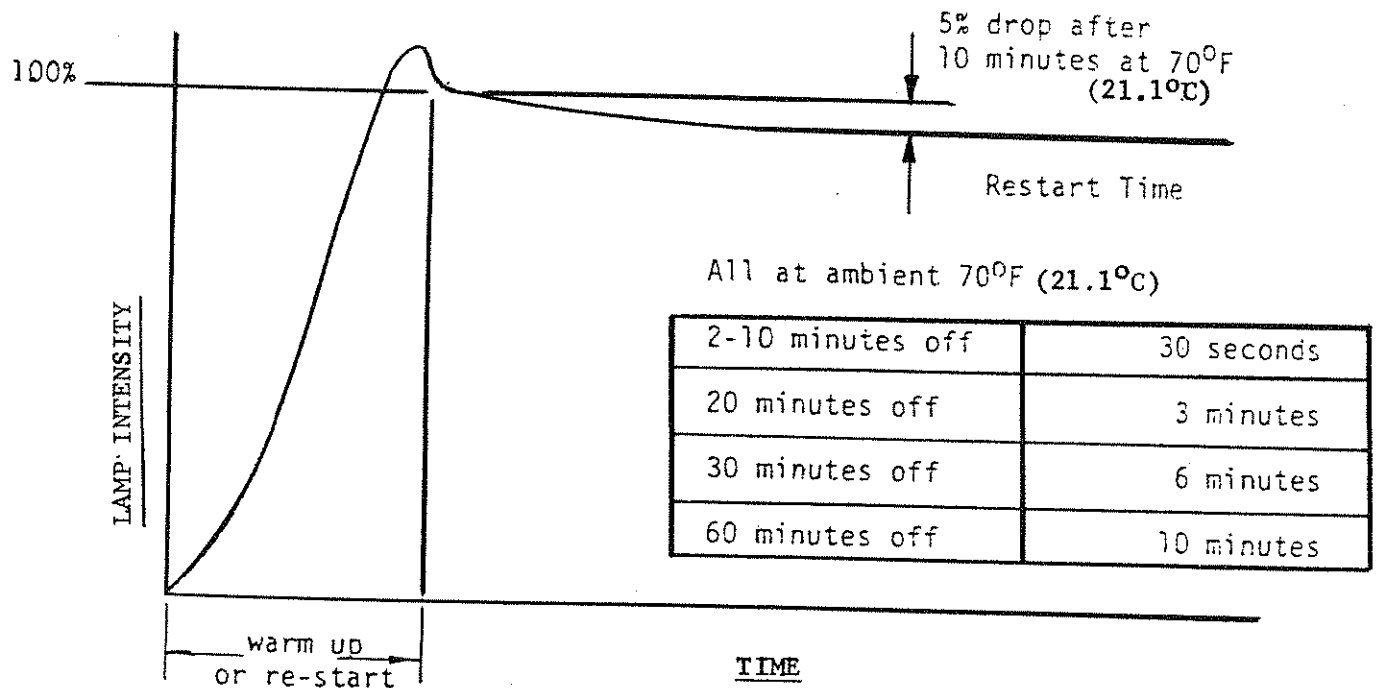


Figure VI-B

Warm Up Time

Ambient 60°F (15.6°C)	20 Minutes
Ambient 70°F (21.1°C)	10 Minutes

## VII. SAFETY

Under normal operation as described in section III, this unit will provide no hazards to personnel due to exposure to high voltage of short wave ultraviolet radiation. At no time should any attempt be made to defeat the interlock of the cabinet. Operation of the lamp any time with the tray open indicates a malfunction which should be corrected immediately by qualified personnel.

The following information is provided to discourage those who might otherwise be tempted to circumvent the safety features of this instrument:

### AFFECT OF SHORT WAVE ULTRAVIOLET ON PERSONNEL

It is essential that adequate precautions be taken in any application of short wave lamps. Prolonged exposures or exposures to high intensities of ultraviolet radiation can cause temporary, but painful inflammation of the conjunctiva (the outer membrane of the eye), as well as histological effects in the cornea, iris, and lens of the eye. Reddening or even burning of the skin (erythema) similar to sunburn will be caused by excessive exposure to ultraviolet energy. In extreme cases, permanent harmful effects can occur.

The glass used in conventional eyeglasses affords adequate eye protection. However, care should be taken that the ultraviolet energy does not enter the eyes from the side, nor is reflected into the eyes from the back side of the glasses.

Other protection should include the ears, particularly when the wearer may be exposed to a number of lamps. It is well to remember that when one is exposed to ultraviolet energy, the effects may not be felt until several hours afterward. Likewise, individuals vary greatly in their sensitivity to radiation. Children, for example, are much more sensitive to ultraviolet than are adults.

Prolonged exposure of the unprotected skin and eyes should always be avoided and people with fair skins should avoid even occasional exposures. Barrier creams and lotions give some protection for brief exposures, but when the exposure is long or the intensity is high,

protective clothing on the hands, face and arms is advised. Enclosures or opaque shield around the source can be used to control the exposure to radiation but avoiding all unnecessary exposure will reduce any possible long-term effects.

Recommended reading: "Criteria for a recommended standard.... Occupational Exposure to Ultraviolet Radiation" published by U.S. Department of Health, Education and Welfare, Public Health Service, Document HSM-73-11009 and "Practice for Occupational and Educational Eye and Face Protection" published by the United States of America Standards Institute, Document USAS Z . 1-1968.

#### VIII. MAINTENANCE

A. The Model C-91LD cabinet is relatively maintenance free. The installations in which this cabinet will be used, i.e. semi-conductor assembly plants, are considered clean environments and should not cause any degradation of the lamp or reflector. The cabinet is finished with a high quality paint so finger marks or dust can be cleaned off with an all purpose detergent cleaner.

#### B. Opening and closing cabinet:

TO BE PERFORMED BY QUALIFIED MAINTENANCE PERSONNEL ONLY.

CAUTION:	<u>Ultraviolet hazard</u> -see section on safety.
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WARNING:	<u>High voltage</u> -disconnect all power before servicing.
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1. Move cabinet to a work station.
2. Remove tray from cabinet, when spring pins lock in place grip the tray on the sides, and with your fingers, release both spring pins. The tray can now be removed from the cabinet. See Figure V-A.
3. Remove four (4) screws on the bottom of unit, lift cover off.
4. Remove lamp leads from ballast, and interlock switch leads, loosen three (3) screws in front panel and three (3) screws in rear panel.
5. Lift lamp assembly off and place upside down in a safe place (Lamp Electrodes Protected).
6. To reassemble reverse Step 2 thru 5.
7. Replace tray and check out operation of lamp, switch, fan and timer before returning to work station.



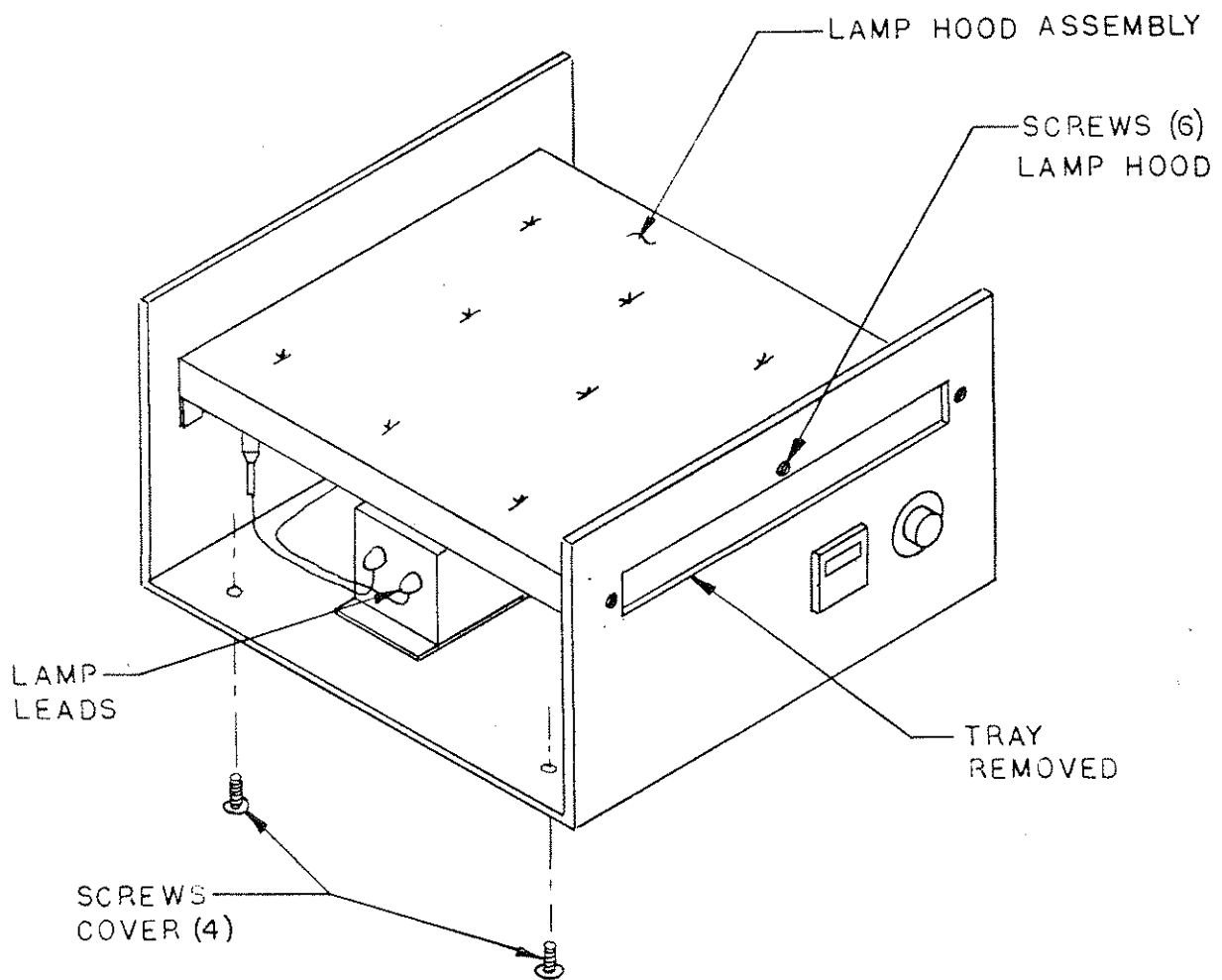


FIGURE VIII- A  
COVER REMOVED

C. Lamp Reflector:

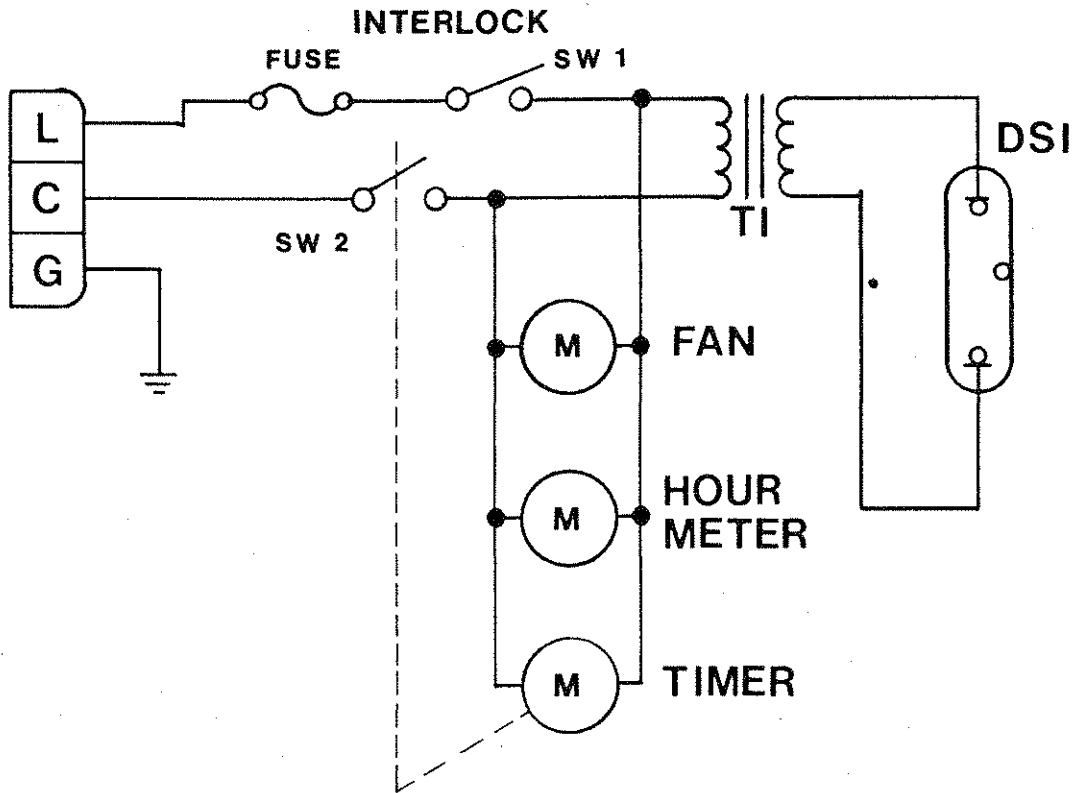
1. In some operating environments, dust and other airborne particles may accumulate on the lamp so that cleaning is required. These are to be done only with:
  - a. Pure isopropyl alcohol, and
  - b. lint free tissue or cloth
2. Apply alcohol to the tissue and lightly wipe each individual tube of the lamp to remove excess dirt. Repeat a second time working from one side to the other to assure each tube is clean.
3. It is very difficult to clean the reflector without removing the lamp, and it is not advisable to do so unless the lamp is defective.
4. Lamp Replacement: If the lamp is broken or its output is low it must be replaced.
  - a. Remove the lead wire connectors from the lamp electrodes by loosening the set screw, then removing the wire and connector together.
  - b. Remove the screws for the grid fastener on the electrode end.
  - c. While holding the grid, carefully unscrew and remove the other grid fastener.
  - d. Remove the grid lamp, taking care not to damage the electrodes.
  - e. Carefully insert the new grid lamp's electrodes through the reflector holes.
  - f. Replace the grid fasteners and install the screws to secure.
  - g. Place the lead wire connectors onto the electrodes. Insert the lead wires into the connectors, making sure that all the strands are inserted and that the wire is seated. Tighten the set screw to secure the wire to the electrode.

WARNING - Do not attempt to splice the lamp leads. Ultraviolet light will degrade many materials and any splicing material used may disintegrate with time and cause an extreme high voltage hazard.

D. Transformer: Open circuit voltage is 6000VAC on the secondary. Operating voltage is 2800VAC nominal at 28-30 ma. If the transformer is not operating properly it should be replaced.

E. Timer, Hour Meter and Fan: All three components are easily replaceable if parts become defective. If the fan is removed or replaced, make sure that the air flow is directed out of the back panel.

F. Cabinet is fused with a slo-blo fuse. Replace only with a equivalent fuse. (See Page 11)



## **SCHEMATIC**

IX. REPLACEMENT PARTS: C-91LD

<u>DESCRIPTION:</u>	<u>Qty/Cabinet</u>	<u>115v/60Hz Reorder Number</u>	<u>200-260V/50Hz Reorder Number</u>
Lamp, Grid with leads and tie wires, C-91	1	92-0021-02	92-0021-02
Transformer	1	40-0030-01	40-0030-02
Fan, Tubeaxial	1	47-0009-03	47-0009-04
Timer, 120 Min.	1	54-0010-02	54-0010-03
Hour Meter	1	54-0034-03	54-0034-04
Rubber Feet	4	72-0004-01	72-0004-01
Fuseholder	1	56-0004-01	56-0004-01
Fuse, Slo-Blo	1	56-0002-01 (2 Amp)	56-0002-03 (1.5 Amp)
Switch, Interlock	1	53-0050-01	53-0050-01
Foam Eprom Pad	1	72-0014-02	72-0014-02
Removable Tray	1	20-0188-03	20-0188-03

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## WARRANTY

UVP's quality products are guaranteed to be free of defects in materials, workmanship and manufacture for one (1) year from date of purchase. Consumable and disposable products, including but not limited to tubes and filters, are guaranteed to be free from defects in manufacture and materials for ninety (90) days from the date of purchase. This warranty does not supersede any statutory rights that may be available in certain countries.

If equipment failure or malfunction occurs during the warranty period, UVP shall examine the inoperative equipment and have the option of repairing or replacing any part(s) which, in the judgment of UVP, were originally defective or became so under conditions of normal usage and service.

No warranty shall apply to any instrument, or part thereof, that has been subject to accident, negligence, alteration, abuse or misuse by the end-user. Moreover, UVP makes no warranties whatsoever with respect to parts not supplied by UVP or that have been installed and/or serviced other than in strict compliance with the instructions appearing in the operational manual supplied to the end user.

In no event shall UVP be responsible to the end user for any incidental or consequential damages, whether foreseeable or not, including but not limited to property damage, inability to use equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of instruments produced by UVP. Nor is UVP liable or responsible for any personal injuries occurring as a result of the use, installation and/or servicing of equipment.



UVP, LLC 2066 W. 11<sup>th</sup> Street, Upland, CA 91786  
(800) 452-6788\* (909) 946-2197\* Fax: (909) 946-3597\* E-Mail: [info@uvp.com](mailto:info@uvp.com)

Ultra-Violet Products Ltd.  
Unit 1, Trinity Hall Farm Estate, Nuffield Rd, Cambridge CB4 1TG UK \*44(0)1223-420022  
Fax: 44(0)1223-420561\* E-Mail: [uvp@uvp.co.uk](mailto:uvp@uvp.co.uk)