

PRINTING LAMP ASSEMBLIES

OPERATOR'S MANUAL

DOUTHITT

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The VIOLUX 3002s, 5002s and SUPER Light Systems feature metal halide lamps whose spectral output matches the sensitivity of daylight films, many plates, and proofing materials. They utilize a metal shutter to obtain short exposures by eliminating warm-up times and spectral shifts that are normally associated with mercury vapor and “instant start” light sources. The VIOLUX operates in a stand-by condition with the shutter closed until an exposure is to be made. The shutter is opened by a light integrator or timer for the duration of the exposure. After the exposure is completed and the shutter closes, the lamp remains lit so that it is immediately ready for the next exposure. A Digital Light Integrator, which is included with some VIOLUX Light Systems, monitors the light intensity to maintain precise, split-second exposure accuracy. A high/low power switch can automatically decrease the light output during exposure for faster materials.

VIOLUX printing Light Systems are designed for mounting over a horizontal printing frame. A printing lamp stand is available for use with vertical frames.

INSTALLATION

Unpacking the Equipment

The VIOLUX 3002s, 5002s and SUPER Light Systems are shipped in two cartons, one containing the power supply and the other the lamp housing. If a printing lamp stand is ordered it is packed separately.

All equipment is thoroughly inspected and carefully packed before leaving our warehouse. Responsibility for safe delivery is assumed by the carrier upon acceptance of shipment. Under ICC Transaction regulations, any claim for damage or loss must be made by the consignee to the carrier.

Claim for Damage or Loss

VISIBLE DAMAGE OR LOSS: Any external evidence of damage or loss must be noted on freight bill or express receipt and signed by carrier’s agent. The form required to file a claim will be supplied by the carrier.

Failure to adequately describe external evidence of damage or loss may result in carrier refusing to honor damage claim.

CONCEALED DAMAGE OR LOSS: Damage or loss may not be apparent until merchandise has been unpacked. The merchandise should be unpacked immediately and inspected for concealed damage. If concealed damage or loss is discovered, make a written request for inspection by carrier’s agent within 15 days of delivery date. Then file a claim with carrier since such damage is carrier’s responsibility.

In the event of damage or loss, SAVE ALL PACKING MATERIAL.

When unpacking the units do not discard any shipping cartons until the equipment is properly installed and operating.

When removing the lamphousing for the VIOLUX 3002s, 5002s or SUPER from its shipping carton, DO NOT LIFT LAMPHOUSING BY THE MOTOR located on top of the unit.

ELECTRICAL CONNECTIONS

Power supplies for the VIOLUX 3002s, 5002s and SUPER Light Systems are designed to operate from 190 to 250 volts, 60 Hz, single phase. A 220 volt grounded wall receptacle is provided with the equipment to match the plug assembly on the power supply. The receptacle should be wired to a 220 volt line with appropriate fuse or circuit breaker rated to handle the current drawn by the equipment as shown:

VIOLUX 3002s	VIOLUX 5002s	VIOLUX SUPER
25 amps	40 amps	50 amps

The cable from the lamphousing must be connected to the terminal board inside the power supply. This can be accomplished by lowering the hinged front panel after removing the three screws. Remove the “U” shaped cable clamp inside the front panel and insert the cable through the cable fitting or rubber grommet hole on the right side of the front plate. Connect the wires into their proper terminals by matching wire colors or numbers. Attach the yellow/green wire to the ground post screw with the nuts and lockwashers provided. Reattach the “U” shaped cable clamp securely over the cable sheath and tighten the screws. Tighten the cable fitting clamp on the outside of the front panel if supplied.

Before closing the hinged front panel the incoming line voltage should be measured with a voltmeter and the wire on the main transformer marked TAP moved to the appropriate terminal as follows:

Incoming voltage	Set TAP to terminal
190 - 209 volts	1 (200V.)
210 - 229 volts	2 (220V.)
230 - 250 volts	3 (240V.)*

* The equipment is shipped with the TAP connected to Terminal 3 (240V).

After the TAP wire is properly connected, the hinged front panel can be closed and held with the three screws.

Remote Control

A timer or integrator connecting cable is supplied which plugs into the receptacle on the right side of the power supply (on the Violux Super, the cable is attached to the Power Supply). The receptacle is wired for 115 volt operation for connection to a timer, light integrator or other exposure control device. The remote control will be operated when 115 volts is applied to the receptacle through the customer's switch, timer or light integrator.

Installation of Lamp

The lamp is supplied separately and must be mounted in the lamp housing. Lamps must be installed from the front of the housing before the safety glass is mounted. In order to install the lamp, the shutter must be open. This is done by turning the unit on and energizing the timer, integrator or exposure control, and then turning off the equipment.

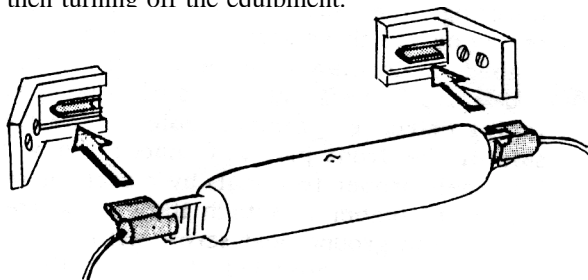


Figure (a)
New style socket

To install or replace the lamp the following procedure should be followed. Make sure that the equipment is unplugged from the wall receptacle before replacing the lamp, and note the caution below.

CAUTION: Do not touch the glass envelope of the lamp with bare hands. Handle the lamps only by the ceramic ends or use lint-free gloves. Lamps should be cleaned thoroughly with the THEIMER cleaning cloth to remove any fingerprints, grease or other contaminants. Failure to follow these instructions may lead to loss of light intensity and premature lamp failure due to devitrification of the quartz. A yellow-brown residue or a ball of mercury inside the quartz envelope is a normal characteristic of VIOLUX lamps. The residue contains the additives which account for the lamp's effectiveness.

This equipment is equipped with a pre-focus Lamp socket. It is important that only Theimer lamps with a 'THS' designation be used. These lamps have flat mounting ends which will match the socket. Older style TH designations will not fit in the lamp mounting socket (The new THS lamps will-fit older VIOLUX equipment).

To install the lamp, place the flat ceramic ends of the lamp into the mounting clips, making sure that the flat ends are securely held. Plug the wire leads securely into their quick-connect terminals on the ceramic insulators. Make sure that the lamp wires are not touching any metal parts.

When replacing old lamps, if the quick-connect terminals are corroded or show signs of arcing, replace them with new terminal lugs which are furnished with each lamp.

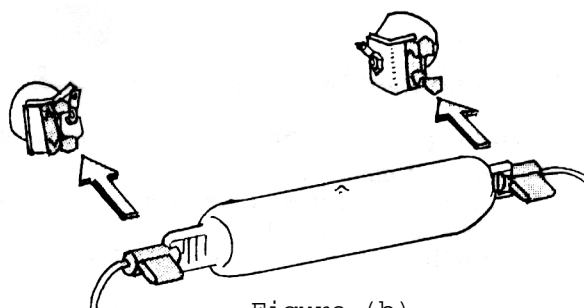


Figure (b)
Old style clips

Safety Glass

The safety glass mounts in two tracks at the bottom of the lamphousing, and can be installed by removing the air deflector and sliding the glass into the tracks at both sides of the housing. The safety glass should be thoroughly cleaned before installation or exposure times may be unnecessarily increased. After the safety glass is in place, the air deflector should be replaced over the ends of the tracks and the screws tightened.

It is recommended that the safety glass be cleaned whenever the lamp is replaced.

Ultraviolet Emission

The VIOLUX lamps emit ultra-violet energy as do carbon arcs, mercury vapor and similar light sources used for printing applications. The safety glass which is furnished with all VIOLUX lamphousings provides adequate protection for the operator by filtering out all UV wavelengths below 320 nm. However, as with any high intensity source, the light should never be looked at directly without the aid of glasses or other ultraviolet absorbing materials. The VIOLUX should not be operated without the safety glass in place.

Overhead Mounting

Units designed for overhead mounting are provided with mounting brackets and wire cable fittings. They can be mounted with wire cables or chains attached to the ceiling. When mounting the lamphousing it is important that adequate ventilation is provided. Placing the lamphousing into a dropped ceiling should be avoided unless the enclosed area around the lamphousing is at least 2 feet larger than the housing on all sides. This will prevent the normally hot air trapped above the dropped ceiling from recirculating back into the lamphousing and causing it to over-heat. If it is necessary to mount the lamphousing higher than the ceiling level, it is suggested that the opening in the ceiling above the lamphouse be enclosed so that the air drawn into the housing by the blower comes from the printing area room.

A thermal switch inside the lamphousing will turn off the lamp if the temperature inside the housing exceeds safety limits.

Printing Lamp Stand

The VIOLUX printing lamp assembly stand consists of a roller base, a lower support bracket and an adjustable mounting bracket. The stand is assembled as follows:

Place the roller base on the floor. Attach the lower support bracket to the sides of the base with the four nuts and bolts provided. Set the power supply inside the support brackets on top of the base. Lamp housing upside down so that the motor housing faces upward. Remove the four screws and washers from the center of each side of the bottom lamp housing panel. Place the mounting bracket upside down over the lamp housing and line up the slotted holes with the four inserts. Attach with the four screws; nuts are not required. Slide back the latches on the lower support bracket. Turn the lamp housing upright and slide the legs of the upper mounting bracket into the lower support bracket. Adjust the height by raising or lowering the upper mounting bracket and latch both sides.

Light Coverage

Proper coverage is determined by the distance between the lamp house and vacuum frame, centering of the lamphousing both horizontally and vertically, and the position of the lamp in its holder. Even coverage can be obtained for various size materials according to the following table:

<u>Material Size</u>	<u>Distance, measured from Front of Hood to Vacuum Frame Glass</u>
30 X 40"	24"*
40 X 60"	32"
50 X 70"	42"
60 X 80"	52"

* For better collimation of light in film applications, it is recommended that the distance to the frame be 32", especially if exposures are to be made through the base of the film.

The distance between the light source and the frame determines the intensity of the light on the vacuum frame, therefore, for shortest exposures, the printing lamp should be placed as close as possible to the vacuum frame where even coverage is still obtained. Exposure tests should be made to determine proper

exposure times and coverage, since these factors depend on the type of material used, frame size, and the type of glass used in the printing frame.

Light intensity measurements made with standard light meters can only be used for comparative purposes since most light meters do not have proper response to the actinic energy emitted by the VIOLUX.

OPERATION

Standby Condition Before turning on the unit, the REMOTE/LOW or HI/LOW switch should be in the REMOTE or HI position. The VIOLUX is turned on by pushing the button marked "I" located on the left side of the front panel or in the VIOLUX SUPER turning the ON/OFF switch ON. The indicator on the front panel will light showing that power is applied to the unit. The printing Lamp in the lamphousing will ignite and gradually increase in intensity as it warms up. If the shutter was left open it will close automatically. During the initial part of the warmup period, the blower in the lamp housing will not operate. As soon as the lamp reaches its proper standby temperature, the blower will turn on. The unit will be ready to operate after the blower has been operative for approximately 90 seconds.

Exposure Control

Exposures are made by applying power to the remote control circuit through a light integrator, timer or switch. When power is applied, the printing lamp and blower are switched to full power and the shutter is opened. At the end of the exposure, the lamp and blower are returned to their low power mode and the shutter is closed.

Low Power Operation

An additional feature on the VIOLUX enables the equipment to expose at reduced power. This feature is useful in certain applications where the sensitivity of material used is too fast for accurate timing at high power exposure levels. In order to expose at lower power, place the REMOTE/LOW or HI/LO POWER switch in the LOW position. When the shutter is open, the lamp will not be switched up to full light intensity. When low power operation is no longer required, the REMOTE/LOW or HI/LO POWER switch should be turned to the REMOTE or HI position.

Turning Off the Equipment

The VIOLUX can be turned off if it will not be used for several hours or at the end of the last shift. If it is anticipated that an exposure will have to be made in less than an hour, it is more economical to leave the unit on, since each time the equipment is turned on, the re-ignition of the lamp shortens the lamp life by as much as a few hours of use, and the power costs for one or two hour standby operation are minimal. The VIOLUX system, because of its ability to remove to high ignition voltage instantaneously when the lamp starts, is much better in respect to aging caused by ignition than other equipment with fixed time delay controlled ignition circuits.

If the equipment is restarted before the Lamp is sufficiently cooled down, the lamp may not ignite immediately. The blower in the lamphousing will automatically turn on, cooling the lamp until it can start. The blower will then shut off until the lamp reaches its proper standby temperature.

Blower Motor Control

The blower motor in the VIOLUX lamphouse is electronically controlled according to the temperature of the lamp. If the lamp cools down between exposures the blower may shut off until the lamp reaches its proper operating temperature. Cooling off of the lamp may be caused by the lamphousing being too close to an air-conditioning unit forcing cold air into the blower system.

Factors Affecting Exposure Times

The VIOLUX Printing Light Systems will expose various materials: plates, proofing materials such as Cromalin[®], Matchprint[®] daylight films and papers.

Some of the factors that can affect exposure times are:

Cleanliness: A dirty safety glass can often cause a greater increase in exposure times than normal lamp aging.

Type of glass used on the vacuum frame: Older glass or glass that has been cleaned with polymer cleaners tend to pass less actinic energy and will increase exposure times.

Acetate overlay sheets and certain film bases on originals can lengthen exposure times.

Proper line voltage and TAP setting.

Exposure times for the VIOLUX should remain relatively constant during the life of the lamp. A gradual decrease in light output due to blackening of the glass around the electrode area is a typical characteristic of all high intensity enclosed arc lamps. VIOLUX Lamps, because of their smaller electrode sizes produce less blackening than similar metal halide lamps and retain their light output for longer periods of time. For this reason, VIOLUX lamps carry a prorated warranty of 1000 hours of use.

Accessories for VIOLUX Printing Light Systems

A VIOLUX Proofing Filter can be supplied for exposing certain proofing materials such as Dylux®, Cromalin® and Matchprint®. This filter is supplied with brackets so that it can be slid into place below the hood and readily removed when not required.

Digital Light Integrator

The VIOLUX Printing Light Systems are available with the Magic 83 Digital Light Integrator. The photocell of the Digital Light Integrator should be mounted at the rear or the side of the vacuum frame by screwing it or taping it onto the top of the metal frame support, making sure that there are no obstructions to block the light to the photocell. The VIOLUX should be turned on and allowed to warm up for at least five minutes before calibrating the integrator. Refer to the Integrator Owners Manual for calibration instructions.

MAINTENANCE

Caution: Any servicing of the lamps or power supply should only be done by a competent electrician or approved technician. Several terminals for operation of the lamp have high voltages.

Electrical Operation

As an aid to trouble shooting, the operation and functioning of various components are listed below. For

details, please refer to the schematics following this section.

Fuses located on the front panel protect the various circuits, as follows:

Fuses I and II: Shutter Circuit

Fuses III and IV: Blower and Main Power Circuits (VIOLUX SUPER only) Main Power Control Circuit

K1: Line Voltage Power Contactor Actuates when unit is turned ON. Contacts apply incoming voltage to equipment.

K2: High/low Power Contactor Actuates by operation of remote control relay K3. One set of contacts by-passes inductance LI for high power operation of lamp, second set of contacts supplies full power to the blower motor when Lamp is operated at high power by by-passing series capacitor.

K3: Remote Control Relay
Energizes with 115 volts from light integrator, timer or remote control switch. Two sets of contacts switch positive and negative DC voltage to change direction of shutter motor, third set of contacts allows K2 to be energized when REMOTE/LOW POWER switch is in REMOTE or HI POWER position.

S1: On/Off Switch
De-energizes coil of KI removing power to equipment.

C1: Capacitor Bank Corrects power factor of equipment to reduce main line current.

C2: Blower Series
Capacitor Reduces voltage to blower motor for proper low-power standby operation of lamp.

F5, 6: Thermal Fuse (F6 only on VIOLUX SUPER)
Turns off main power if temperature exceeds safety limits.

T1: Main Transformer
Regulates current and voltage to lamp. Provides low voltage for operation of shutter circuit.

- L1: Inductor
Limits current to lamp for standby operation.
- A1: Printed Circuit Board (VIOLUX SUPER Only)
Contains bridge rectifier, electronic control for blower and lamp ignition circuit. (See A2 and A3 for description)
- A2: Bridge Rectifier (VIOLUX 3002s and 5002s)
Supplies positive and negative DC voltage for shutter motor.
- A3: Printed Circuit Board
Electronically controls operation of lamphousing blower to maintain proper lamp temperature.
- S4,5: Shutter Limit Switches
Removes DC voltage to shutter motor and connects braking diode when activated.
- V1, 2: Steering Diodes Shorts out armature of shutter motor through limit switches to dynamically brake motor.

Check of Main Transformer

With TAP voltage properly set, the main transformer should provide the following AC voltages. Voltages are measured to Terminal 4 (R) unless otherwise specified.

<u>Terminal</u>	<u>Voltage</u>
1	200
2	220
3	240
6	800 (lamp not lit)

Voltage between Terminals 8 and 9, and 9 and 10 should be 11 VAC.

Operation of Lamp Circuit

The VIOLUX equipment utilizes a constant wattage inductive ballast to provide the proper operating currents and voltages for the metal halide lamp. This type of ballast, utilizing a saturable transformer and series inductance is superior to the older style capacitance ballasts since it reduces arcing caused when switching capacitors in and out of the circuit, and com-

pletely eliminates capacitor breakdown due to constant wall flexure, when rapid changing and discharging capacitors is required.

When the lamp is ignited it offers a very low electrical resistance, so that the current is relatively high. The high current saturates the transformer, reducing the voltage across the lamp which limits the current to a safe value. As the lamp warms up, more of the additives are vaporized, increasing the lamp resistance. The current is reduced and the voltage across the lamp increases by the action of the transformer until the lamp is sufficiently warm. At this time, the blower is electronically activated, maintaining proper lamp temperature, and the lamp voltage and current reach their proper standby operating levels. When the lamp is switched to high power for an exposure the series current limiting inductance is by-passed to increase the lamp current to its full output.

Shutter Motor Control

The shutter circuit consists of only five component parts. A separate winding on the main power transformer generates 11 volts AC, which is rectified to positive and negative 12 volts DC. The positive and the negative DC voltage, which determines the direction of rotation of the shutter motor, is fed to the motor through contacts of the remote control contactor and either of two shutter limit switches. When the shutter reaches the end of its travel, the limit switch is activated, removing the voltage from the motor. The other contact of the limit switch dynamically brakes the motor through a steering diode which is connected across the motor armature. Both the opening and closing circuit of the shutter are identical, with the exception of the polarity of the DC voltage fed to the motor and of the steering diode across the limit switch.

High Temperature Cutout

Should the temperature inside the lamphousing exceed 80°C, a thermal fuse will open, de-energizing the equipment. Once the fuse has opened, it will not be possible to re-start the equipment until the lamphouse has sufficiently cooled down.

Frequent operation of the thermal protection device may not indicate a malfunction of the equipment, but may be due to inadequate circulation of cool air into the blower.

Type of Trouble	Possible Cause	Test Procedure and Remedy
Shutter does not open, remote control relay does not energize when timer is activated.	Voltage not applied to remote control relay. Remote control relay defective.	Check voltage to relay from timer or light integrator. Measure voltage on coil of relay. If voltage is present, relay is defective. Replace relay.
Shutter does not open, remote control relay activates.	Fuses I or II blown. Rectifier defective. Contacts of remote control relay defective. Shutter is mechanically jamming. Defective limit switch assembly. Defective motor.	Check Fuses I and II. Check DC voltage of rectifier. Check for DC voltage between black and gray and brown and gray terminals on terminal board. Voltage should switch from + to - when remote control relay is activated. If not, replace remote control relay. Check shutter for jamming. Make sure shutter is fully closed and limit switch is activated. Check activating arms of limit switch. Check continuity through limit switches with ohmmeter. Check operation of braking relay (older units only, newer units have braking diodes). If braking relay operates properly (diodes good), replace motor.
Shutter does not close.	Shutter jammed partially opened.	Mechanically open shutter by hand with power off until it hits limit switch (Note: old style oval motor only, new round style cannot be forced).
Shutter opens or closes noisily.	Component failure. Improperly adjusted limit switch actuator.	Follow procedures described above. Bend limit switch arm until shutter stops quietly.
Blower motor in lamp housing does not operate after warmup.	Motor mechanically binding. Defective contacts of K 2. Defective capacitor C 2.	Check rotor of blower motor to see that it turns freely. Check contacts.
Blower motor in lamp housing does not go to high speed when exposure is made.	Defective contacts of Contactor K 2 or open wiring.	Check capacitor with ohmmeter after disconnecting one side. Check contacts. Check for loose wire in blower circuit.

Circuit Symbol	Description	VIOLUX 3002s	VIOLUX 5002s	VIOLUX SUPER
Power Supply				
T1	Transformer, main power	43777	43779	44028
L1	Choke	44529	44577	44560
C1	Capacitor, 30µfd (replacement)	(4) 23755	(6) 23755	(6) 23755
C2	Capacitor	23737	23739	23739
B1	Fan motor 220 vac	43351	43351	43410
K1, K2	Contactora, 220 vac (R26)	(2) 63725	(2) 63725	(2) 63725
K3	Relay, 115 vac (R9)	63717	63717	63717
A1	Printed Circuit board	-----	-----	56789
A2	Rectifier PC board	95108	95108	-----
F1-4	Fuse, 4 amp	(3) 63306	(3) 63306	(4) 63306
	Fuseholder	(3) 63352	(3) 63352	(4) 63352
I1	Indicator lamp, neon, 220V	70151	70151	70151
	Lamp socket	70906	70906	70906
S1	Switch, main power	70912	70912	71301
S2	Switch, hi/low power	71301	71301	71301
	Receptacle, main power, 250 vac	50303	50305	50305
	Receptacle, 115 vac w/ ground	50304	50304	-----
	Line cord assembly	80519	80520	80520
	Power supply housing	60068	60068	60068
Lamp Housing				
C3	Capacitor	23736	23738	23738
V1,2	Diodes, Braking	95516	95516	95516
M1	Motor, shutter 12 vdc (replacement)	95499	95499	95499
B2	Blower motor, 220 vac	43455	43401	43401
S4,5	Limit switch	(2) 72104	(2) 72104	(2) 72104
F5	Thermal switch, 80°C.	72202	72202	72202
A3	PC board, blower speed control	56528	56528	-----
	Shutter assembly (internal Limit Switch)	162247*	162247*	-----
	Shutter assembly (external Limit Switch)	-----	-----	161729*
	Motor gear (for 95499)	160432	160432	160432
	Shutter gear (replacement)	(4) 68714	(4) 68714	(4) 68714
	Lamp cable, 8-conductor (specify length)	80521	80521	80521
	Safety glass	101140	101140	101140

*as originally sold