

Gene Tools UV Lightbox Owner's Manual

The Gene Tools lightbox is a laboratory appliance designed for use with Photo-Morpholinos. 365 nm light is used to decompose the photo-cleavable moiety of a Photo-Morpholino. The Gene Tools lightbox provides narrow-bandwidth 365 nm light, minimizing damage to biological samples from shorter-wavelength light while providing the optimum wavelength for Photo-Morpholino cleavage. A microlens and diffuser provides an even light field across the bottom of the sample tube. A blower and heat sink minimizes heating of the sample during light exposure. An opaque cap and interlock shields the user from light during exposure. A digital timer controls the duration of light exposure. An external power supply and voltage regulator allows operation with 110 V or 220 V AC power.

Quick start

- Place light box on surface with unobstructed airflow to vents
- Plug power supply into light box and power source
- Turn on switch on back of lightbox
- Remove copper cap from slot in tubeholder
- Place sample in flat-bottomed tube and lower gently into sample holder atop box
- Place copper cap over sample into round slot
- Check that exposure time is set to 300 seconds, adjust time up or down if needed
- Push red button under "Start", wait for exposure to finish
- After green light on front panel turns off, remove copper cap & remove sample

Caution



This device uses ultraviolet (UV) LEDs. During operation these LEDs radiate intense UV light. Do not look directly into the UV light or look through the optical system. When there is a possibility to receive reflected light, wear longpass UV light protective glasses.

Operation

Place the copper cap into the circular slot atop the aluminum tube holder on top of the lightbox. Plug the power supply into the jack on the back of the lightbox. Plug the other end onto a 100-240 Volts AC, 50-60 Hertz power socket. Turn the device on using the power switch located on the back of the unit.

Once the unit is powered up, the following screen will be displayed on the LCD:

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EXPOSURE TIME: 300s
Start   Up   Dn (Vx)
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(Note - (Vx) will be replaced with the firmware version of the device you are using.)

1. Place the sample to be illuminated in a flat-bottomed shell vial*.
2. Remove the copper cap and gently lower the flat-bottomed vial into the center of the tube holder.
3. Replace the copper cap.
4. The exposure time can be increased using the middle button under the LCD screen and decreased using the rightmost button. Exposure time ranges from 5 seconds to 9995 seconds (about 2 hours and 47 minutes) in increments of 5 seconds. Press and hold the button for faster scrolling through exposure times.
5. To start the exposure to UV light, press the leftmost button on the front panel of the lightbox (the button below the "Start" displayed on the LCD).
6. When you press start, the LCD screen will display a countdown timer and the green LED on the front panel will illuminate indicating the internal LED array is ON.

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TIME LEFT: 150
Stop
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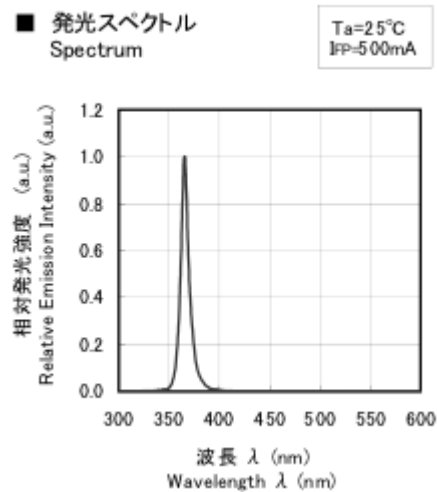
When the timer expires, the green LED turns off and the device will beep, indicating the exposure had completed. If you wish to terminate the exposure early, press the red button underneath the "Stop" on the LCD screen.

Note - If you remove the cap before the exposure is finished, the LED array will turn off, the unit will beep and the timer will suspend; replacing the cap silences the beep, restarts the LED array and resumes the timer from where it suspended.

* A few vials were shipped with the unit. They are 4.0 ml catalog 225126 shell vials from Wheaton, 15 mm diameter and 45 mm high.

Light source and path

The internal LED array emits at a peak wavelength of 365 nm with maximum optical power of 950 mW. Light intensity is factory matched to a unit running 90% maximum intensity to ensure light intensity is consistent between lightboxes. The light passes through a lens system and a ground-glass diffuser before reaching the bottom of the sample tube.



Control hardware

The lightbox uses a microprocessor for reproducibly controlling the time of exposure. The three red buttons on the front panel are used to start or stop the exposure and for menu operations. (See Operation section)

Cooling

The LED array is cooled by an aluminum heat sink and blower. Place the unit on a hard flat surface so that the cooling vents underneath the front of the unit are not obstructed. Do not operate the lightbox in a dusty environment, as the blower will draw dust into the unit and blow it onto the optics. Do not obstruct the air vents on the bottom, side or back of the unit. The fan runs a few minutes after exposure is complete.

Cap and interlock

A copper cap covers the tube holder and is sensed by an optical interlock which turns off the LED array if the cap is removed during operation. Never block the light path of the optical interlock with any object except the copper cap.

Power supply

Power: 100-240 Volts AC, 50-60 Hertz, 1.4 Amps into the external power supply supplied with the UV lightbox. The lightbox is protected with a 3A fuse.

Troubleshooting

If the LCD display does not come on after the lightbox is plugged in, unplug the unit and inspect the fuse. The fuse is in the fuse holder on the back of the unit. If the fuse is blown, replace it.

If the LED array inside the lightbox is turned on when the cap is off, you will see a blue light from the hole in the tube holder. If the LED array remains turned on when the cap is removed during a light exposure, replace the cap and wait for the exposure to finish. When the green LED on the front panel has turned off, remove the cap and the sample tube and inspect the circular channel in the tube holder. Find the black plastic optical interlock. Gently clean the optical interlock with a cotton swab dampened with water. This should restore the normal operation of the interlock. If the LED array still does not turn off when the cap is removed during an exposure, contact Gene Tools for technical support.

If material is spilled into the unit or if the unit becomes dusty, material in the light path might decrease the light intensity reaching the sample. You can clean the top of the ground glass diffuser disk using a damp cotton swab. The disk is the surface where the sample tube rests during operation. Turn off the unit, remove the copper cap and sample tube (if present) and reach down through the tube holder with the damp cotton swab to gently clean the glass disk.

Warranty

The lightbox is warranted for defects in parts or assembly for one year. Contact Gene Tools customer support for warranty service or replacement. Do not unscrew and open the lightbox case; parts inside are not user-serviceable. Opening the case voids the warranty.

Contact Information

Gene Tools LLC
1001 Summerton Way
Philomath, OR 97370 USA
(541) 929-7840
custsupport@gene-tools.com
www.gene-tools.com