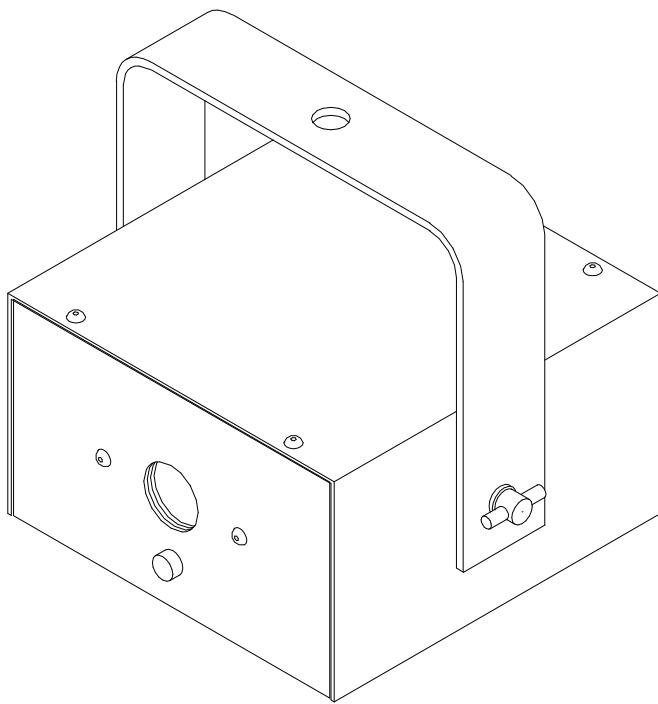


WAVELIGHT^â MODEL WVL-LX USER INSTRUCTIONS

Description:

The Wavelight WVL-L1 and L2 models are compact, lightweight moving pattern projectors which use advanced long lifetime LED light sources. The units are designed to project a moving pattern of light with an irregular character resembling the reflection of light off of the surface of water, or the refraction of light through a water surface. Two pattern wheels rotated by gear reduction motors produce the moving effect pattern. The projection lens mount allows for adjustment of effect focus. Electronic adjustments are provided for control of effect motor speed and direction, and the intensity and or color balance of the white, blue / green, or other LED emitters installed. Installation of gel or dichroic color filters or aperture plates in the filter slot provided will create further variations in the appearance of the output pattern, and a DMX control option is available to provide remote control of the fixtures for professional lighting applications.



Recommended Use

The Wavelight WVL-LX fixtures are intended for use in applications where the appearance or illusion of a nearby water surface or an underwater environment is desired. The fixtures are intended to operate from a low voltage DC power source using the AC adapter provided, and should not be connected directly to AC power. Fixtures can also be operated from any suitable DC power source with appropriate voltage, polarity, and current rating. .

General Precautions

The Wavelight fixture is intended for indoor special effect applications in theme parks, themed attractions, themed restaurants or scenic displays, and for any other specialized lighting application where the illusion, impression, or appearance of a nearby water surface, or underwater environment is desired, without any of the difficulties associated with real water.

CAUTION

The fixture is intended only for indoor use in dry locations. The unit is not intended for outdoor use, or for indoor use in close proximity to an actual body of water. The fixture is not rated for, nor protected against water splash, droplets, or mist.

Electrical Precautions

The Wavelight projector is provided with a Class II AC power supply with a total cord length of 4 feet minimum. The AC power supply or power cord may be connected to any standard domestic electrical outlet, or to foreign outlets with appropriate adapters. The output connector of the power supply has a coaxial DC power connector which mates with the input socket at the rear of the Wavelight fixture. To connect the Wavelight to the power supply, install the coaxial plug into the socket at the rear of the unit. Once the DC connector is attached, the power supply module or power cord may be connected to the AC power source.

WARNING

DO NOT CONNECT THE WAVELIGHT FIXTURE DIRECTLY TO ANY AC POWER SOURCE

Application of AC voltage to the fixture will cause serious damage to the fixture, which is not covered by the fixture warranty, and may cause increased risk of electrical shock or fire, potentially resulting in serious injury or death.

The Wavelight WVL-LX models are usually shipped with a “Universal Voltage” AC power supply which can operate the fixture from 100 to 240 volt AC line voltage at either 50 or 60 Hertz. Do not attempt to operate the unit or power supply from unknown or incorrect AC voltages. Do not operate any universal voltage power supply from a dimmed AC lighting circuit.

DC Power Connections

For applications where DC power is available, the AC power supply may be omitted, and the fixture operated directly by DC power. The recommended DC power supply must have a voltage of either 9 or 12 volts at a current of 2 amperes minimum. The DC power input socket on the fixture is a standard 2.1 mm female coaxial DC socket, where the 2.1 mm center pin is the positive connection, and the outer sleeve is negative. The output connector of the DC power supply should be equipped with a male coaxial DC power plug, wired with correct polarity to mate with the input socket at the rear of the Wavelight fixture.

WARNING

The WVL-LX Wavelight fixtures are designed to operate on 9 or 12 volt DC power, depending on the fixture model and date of manufacture. The correct voltage is marked on the rear panel of each fixture. Application of AC voltage, incorrectly polarized DC voltage, or DC voltages outside of the normal range to the fixture may cause serious damage to the fixture, and may cause increased risk of electrical shock or fire, potentially resulting in serious injury or death. Do not attempt to operate the unit with incorrect or unknown DC supply voltages.

Mounting

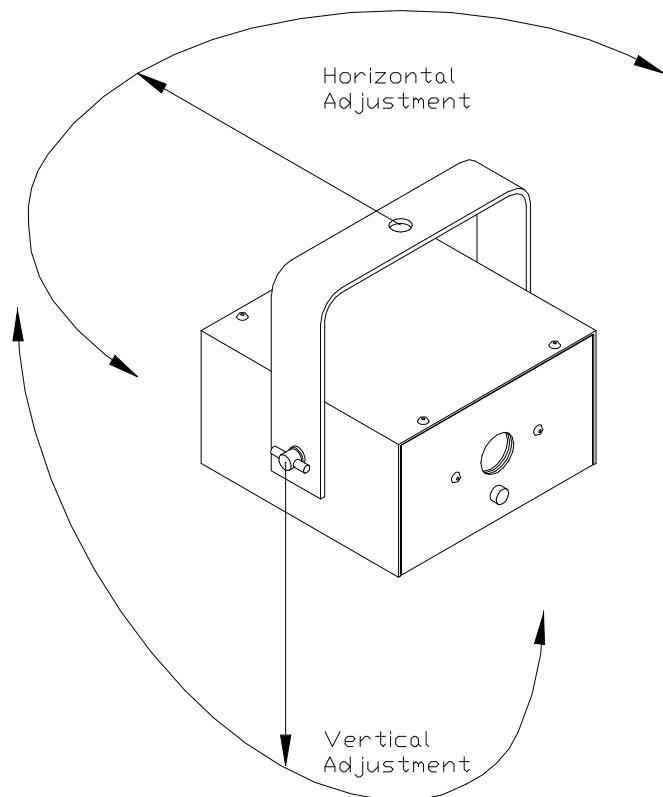
The Wavelight WVL-LX fixtures include a mounting yoke with a 1/2" hole at the center for hanging the instrument. The Wavelight is normally attached to a mounting "C-clamp" or other stable means of support using the yoke mounting hole and an appropriate bolt and washer. The unit can be mounted in any orientation, keeping in mind that intensity and speed adjustments or connections must be made at the rear of the unit, and focus adjustments from either the top or bottom.

Operation

The unit will begin to operate immediately upon application of power, with the light sources and effect motors operating at their preset intensity, direction and speed settings. The unit will project a moving pattern of light with an irregular character resembling the reflection of light off of the surface of water, or the refraction of light through a water surface. The unit will continue to operate in this manner until the settings are readjusted to the users preference. The fixture is rated for continuous operation, and in normal use the unit will continue to display the preset output pattern until power is removed.

Aiming

The instrument can be pointed using the mounting hole on the yoke as a directional pivot. Tightening the mounting fastener will lock the instrument in that axis. The mounting yoke attaches to the sides of the instrument with two thumbscrews. Loosening the thumbscrews allows adjustment of the instrument in elevation. Tightening the thumbscrews locks the elevation axis. The user is responsible for mounting the instrument in a safe and secure manner. Please consult with local public or workplace safety authorities to determine if any additional safety restraints, such as safety wires or cables may be required.

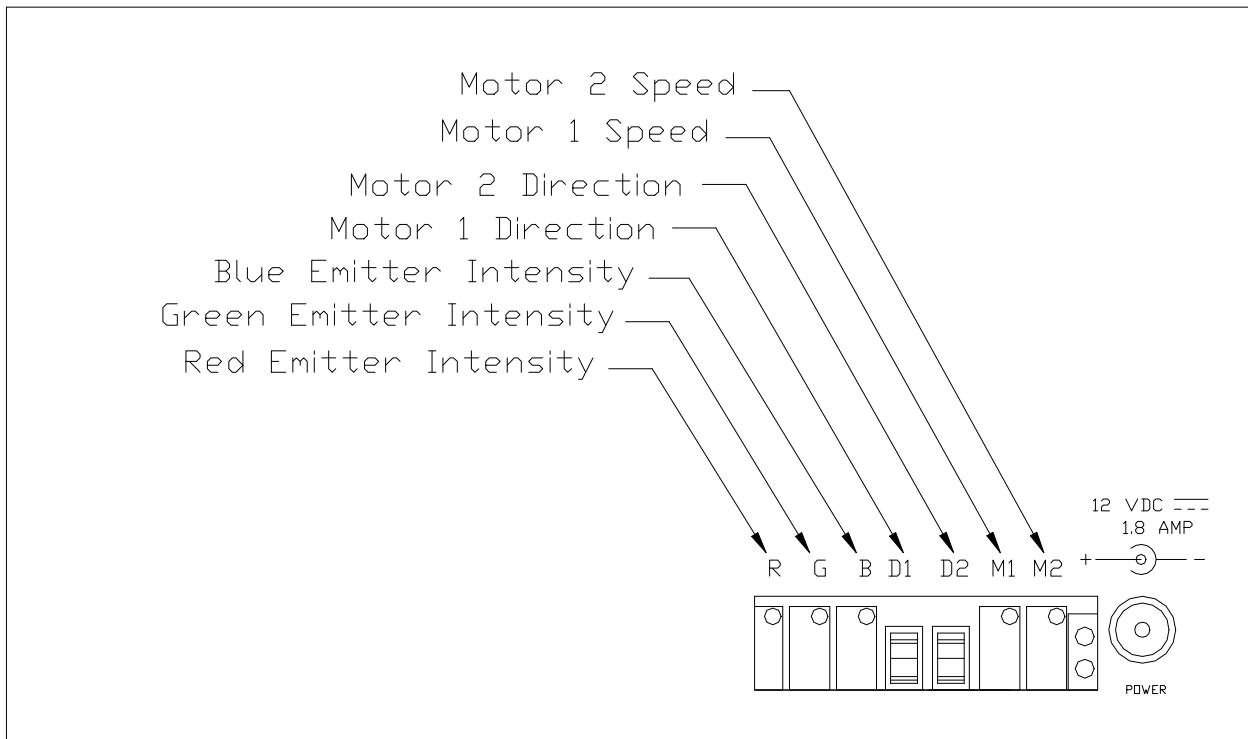


Effect Adjustments

All controls for effect intensity, color, speed, and direction are accessible at the rear of the unit. The LED intensity and effect motor speed controls are multi-turn potentiometers. Rotating the trimmer controls clockwise increases the intensity or speed setting, and counterclockwise adjustment will decrease the setting. The controls are very precise, and several turns may be required to produce a significant change. The controls do not stop or tighten at the end of their adjustment range, but will continue to spin without causing any additional change at minimum or maximum settings.

The controls for motor direction are small switches. In one position, the associated motor will rotate clockwise at the preset speed, and counterclockwise in the other setting. The motor direction can be reversed at any speed setting without damage.

All of these controls can be adjusted using a small slot-blade screwdriver without opening the unit case. Be careful not to apply excessive force to any of the effect adjustment controls.



Changing Motor Speed

The two motor speed controls are used to adjust the rate of motion in the output pattern. The adjustment ranges from slow enough to be barely perceptible, to very rapid and turbulent. For the most natural appearance, both controls should be set from 5 to 7 turns from minimum. Higher or lower settings may be used depending upon the display requirements. It is normal for the slight noise level from the effect motors to increase at higher speed settings, but the motors will not be damaged by prolonged operation even at maximum speed settings.

Changing Motor Direction

Two switches control the direction of the two effect motors. Each switch controls one of the motors. The switches can be adjusted using a small slot-blade screwdriver or probe without opening the unit case. The switches are accessible between the LED Intensity and Motor Speed controls on the rear panel of the fixture. The switches are recessed to prevent accidental motor direction changes. Motor direction can be changed by using a small screwdriver or probe to gently engage the switches, and move the switch toggle or rocker. Avoid applying excessive force to the switches.

The motion of the projected effect can be significantly altered by changing the direction that the pattern wheels rotate. Wavelight units are shipped with both motors turning the same direction. Due to the arrangement of the wheels, this produces an effect of overlapping up and down motion, which cancels out to appear quite neutral with the motors at equal speed. Changing the direction of one motor will alter the pattern so that all of the effect motion will be upward or downward. If the resulting motion is not in the desired direction, i.e. up when you want down, then changing the direction of both motors will correct the pattern motion. To obtain more swirling, or interaction in the effect, one of the motors should be operated at a slightly faster or slower speed than the other.

Changing Intensity and Color

The fixture electronics have provisions for controlling up to three LED emitters, one each Red, Green, and Blue, not all of which may be installed. For each installed emitter, the intensity of the selected color is adjusted by increasing or decreasing the setting of the matching trimmer. The balance of color between two or three emitters, and the overall intensity of the fixture may be adjusted to the users requirements by using these controls as necessary.

Wavelight WVL-L1 fixtures use a single LED emitter, usually white in color, and intensity control may be provided using one, two, or all three “Intensity” controls depending on the type of emitter installed. Fixtures with white emitters are most commonly used for “reflected sunlight” effects, where the unit is intended to create the appearance of light reflecting from a nearby water surface.

The Wavelight WVL-L2 fixtures are most commonly equipped with blue and green LED emitters, and the intensity of each of these colors will be controlled by the respective trimmer. Fixtures with blue and green emitters are most commonly used to create “underwater” effects, where the intent is to create the appearance of a submerged environment, or the type of pattern which appears on the bottom of a shallow body of water.

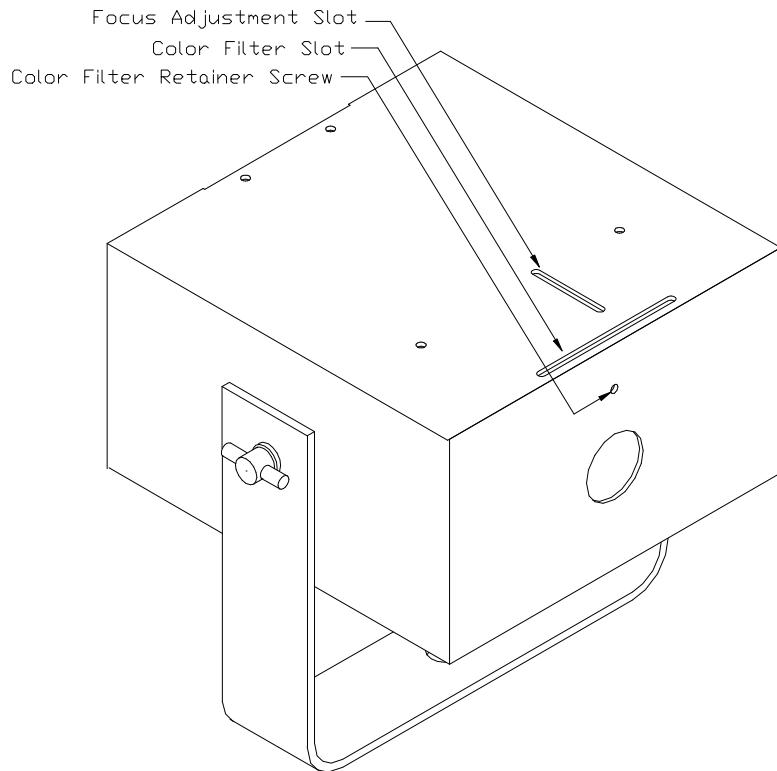
The Wavelight WVL-L3 fixtures include red, green, blue LED emitters, with the intensity of each of these colors again controlled by the respective trimmer. Fixtures with three emitters can be used to create all types of “reflected sunlight” or “underwater” effects, and can create many other natural and unusual effects due to the wide variations in projection output which is possible with these units. .

Dimming

The Wavelight WVL-LX fixtures cannot be operated from dimmed AC lighting circuits due to the adaptability of the “Universal Voltage” power supply provided, which will attempt to compensate for the variable input voltage. The unit should not be dimmed by attempting to vary the DC power supply voltage either. If dimming is required in any application, the fixture should be ordered with the DMX control option

Focus Adjustment

The effect focus can be varied by moving the projection lens. This may be accomplished without opening the unit case. Two small thumb screws on the upper or lower surface of the unit secure the lens mount. Loosen both screws slightly, (but do not remove either screw) and use one of them as a handle to slide the lens mount forward or back until the desired focus is achieved, then tighten both thumb screws securely.



Filter or Gel Installation

A slot for a filter or color gel is provided at the front of the Wavelight. Color filters or gels should be cut to two inches by two inches, or 50mm square in size, and be no thicker than 1/16 inch, or 1.5mm. A thumbscrew at the front of the unit retains the filter or gel. Note that the adjustable color range available from multi-color fixtures will generally make gels or dichroic filters unnecessary to select colors, but that filters or apertures may still be useful to change the character and appearance of the projected display. .

To install or change a filter, disconnect power to the unit, remove the thumbscrew next to the output port, and slide the filter into the slot in the case top or bottom nearest the thumbscrew. The filter or gel should be pushed into the slot until it stops, or at least until the edge of the filter or mount is clear of the thumbscrew hole. Reinsert the thumbscrew and gently tighten it to retain the filter. If it is possible to invert the Wavelight unit when installing a filter or gel, the filter can be simply dropped in or out of the slot after removing the thumbscrew. Be sure to replace the thumbscrew before turning the Wavelight right side up to hold the filter in place. Reconnect power, aim, and focus the unit for normal operation.

LED Emitter Lifetime

The LED light sources used in the Wavelight WVL-LX fixtures should operate for tens of thousands of hours, or several years of daily operation without requiring replacement. A decrease of from 25 to 30 percent in intensity can be expected after approximately 100,000 hours of operation. If the unit is mounted close to high wattage fixtures, or otherwise operated in hot environments, the output of the LED emitters may decrease more rapidly, but should not require replacement over the lifetime of the fixture.

In the event that a fixture appears to be operating at reduced output, especially if the selected output color changes abruptly, it is possible that one of the LED emitters has failed prematurely. The unit may be returned for service if an LED emitter failure is confirmed after closer evaluation of the unit for improper control settings, dust or dirt contamination, or other routine problems.

Maintenance

Although the fixture is designed for continuous operation, for the longest motor lifetimes, the fixture should be operated only when an active display is required, and should be powered off when display is not needed.

The only maintenance recommended is a periodic cleaning to remove dust accumulation from the fixture. The proper cleaning interval is determined by the amount of dust in the environment, which may be established by inspecting the unit at regular intervals over the first 12 months of operation.

Although the WVL-LX units are convection cooled, without fans to draw air or dust through the fixtures, dust will eventually build up outside and inside the fixture over time. Heavy accumulations of dust will reduce the fixture output, and may reduce the airflow over the unit, resulting in increased temperatures and reduced LED lifetimes.

Periodic cleaning with compressed air or bottled gas will remove most light dust contamination. Heavy dust contamination may require removal of the fixture outer cover for more thorough cleaning of the interior and optics using compressed air, aided by a soft dry brush or tissue paper. Severe contamination by dust in combination with oil, and fog or smoke fluid residue may require the use of a cleaning cloth or tissue dampened with water, or a water based cleaner to thoroughly remove dirt from the fixtures exterior, interior, and optical surfaces. Proper cleaning will generally restore the fixture to original performance.

The two DC effect drive gearmotors installed in the units are sealed and permanently lubricated, and should not require maintenance over the lifetime of the fixture. Some minor leakage of oil from the motors may be expected over time, but this is not an indication of motor failure, and is objectionable mainly because of the dust it tends to capture inside the fixture.

After prolonged operation, typically 15 to 20 thousand hours, the gearmotors may fail to operate due to brush wear or contamination. Temporarily running an inoperative motor at a high speed setting may clear off contaminated brushes and restore a motor to normal operation. Worn out brushes will eventually require the installation of replacement effect drive motors.

Most routine problems can be resolved by following the recommendations on the following page. If these guidelines do not solve the problem, please contact the manufacturer directly with any questions about the operation or repair of any Wavelight fixture models.

Troubleshooting

<u>Problem</u>	<u>Probable Cause</u>
Fixture completely inoperative	No AC line voltage to power supply Power supply input cord unseated at supply Power supply output cord unseated at fixture Incorrect or defective DC power supply All control settings at minimum
Effect motors operate normally, but no light output from one or more emitters	LED Emitter intensity settings at minimum Defective LED emitters or LED drivers
LED emitter intensity too low	LED Emitter intensity settings not at maximum. Note that single color fixtures may require more than one intensity channel to be set to maximum in order to operate at full intensity.
LED Emitters operate normally, but no motion or animation	Motor speed settings at minimum Defective effect motors or drivers
Fixture buzz or excessive noise	Some hum and quiet buzzing sound is normal Defective or worn out effect drive motor
Weak or uneven output pattern	Fixture focus set incorrectly Fixture optics dirty or damaged
No pattern motion, or directional motion.	Fixture effect wheel loose or jammed Defective or worn out effect drive motor
Fixture is excessively hot	High ambient temperature at fixture location Ventilation blocked or obstructed by dust Incorrect DC input voltage