

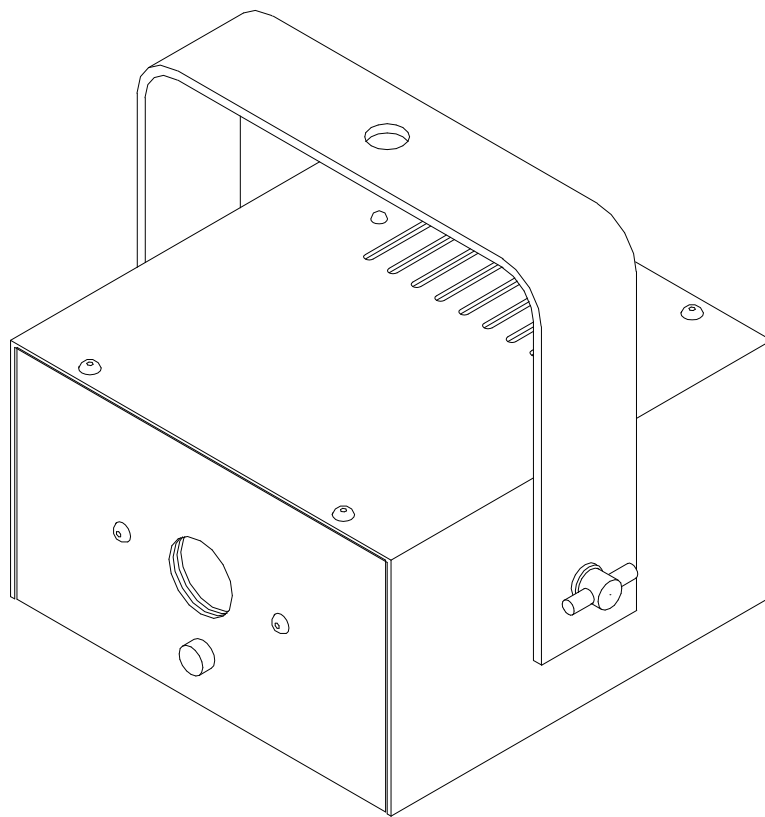


WAVELIGHT USER INSTRUCTIONS

Description:

The WaveLight is a compact, lightweight low-voltage powered moving pattern projector. The unit is designed to project a moving pattern of light with an irregular character strongly resembling the appearance of light reflected off of a surface of water, or underwater light transmitted through a wavy water surface.

The patented refractive optical system is very efficient, using two pattern wheels rotated by gear reduction motors to produce a bright and dynamic effect pattern using a 35 watt MR-11 incandescent light source. The motor speed may be adjusted to obtain the desired projection appearance. The projection lens mount slides to provide easy adjustment of effect focus, allowing further variations in the appearance of the projected pattern. An internal color filter slot allows for easy installation of gel or dichroic color filters or aperture plates, which will allow the designer to create anything from highly realistic projections of water images to water reflections with unnatural speed, color, or other characteristics.



Recommended Use

The WaveLight fixture is intended for use in applications where the appearance or illusion of nearby water is desired, without the difficulties of using actual water. The fixture is provided with a 12 volt AC ballast which will operate from a 120 volt AC power source, or a 120 volt AC lighting dimmer circuit or channel.

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 or appearance of nearby water, or the impression of an underwater environment is to be created.

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 water or water spray. The fixture is not rated for, nor protected against water splash, droplets, or mist.

Mounting Precautions

When the fixture is operating, there must be at least 3 inches of free air space clearance around the top and bottom ventilation slots on the unit case. Do not allow any flammable material to block the fixture output, contact the fixture case, or obstruct the ventilation slots.

WARNING

Never operate the WaveLight fixture with the case in contact with flammable materials. Do not direct the fixture output onto any flammable materials at distances of less than twelve inches. Flammable material in contact with, or in close proximity to the fixture case may be ignited by the lamp output, increasing the risk of fire which may result in serious injury or death. Do not attempt to operate the unit without all covers closed and secured in place

Electrical Precautions

The WaveLight projector is equipped with a 6 inch cord ending in a two pin power connector. The units are usually shipped with a 12 volt AC or DC ballast. The ballast transformer usually supplied with the unit has a 7 foot output cord with a matching two pin connector. To connect the WaveLight to the transformer, first make sure that the transformer unit is disconnected or turned off, then align the two connectors and slide them together. The connectors will only fit one way. If they do not connect, turn one of the connectors over and try again. Once the connector is attached, the transformer may be plugged in.

WARNING

The WaveLight is designed to operate on 12 volt AC or DC electrical power, not 120 volt line voltage. Application of AC or DC voltages greater than 12 volts, or 120 volt AC line voltage to the WaveLight 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 supply voltages, or with substitute power supplies of unknown voltage or DC polarity.

The standard 120 volt AC ballast transformer is compatible with lighting dimmer circuits, and allow the output of the WaveLight fixture to be dimmed like an ordinary lighting fixture. WaveLight fixtures for export applications may be provided with a “Universal Voltage” 12 volt DC power supply or ballast. These units are not compatible with lighting dimmer circuits, as the voltage agility of the power supply will attempt to compensate for the drop in line voltage caused by the dimmer.

Mounting

The unit can be mounted in any orientation, keeping in mind that the ventilation areas at the top and bottom of the unit must remain unobstructed for proper cooling. The unit should also be positioned for easy access to the door provided for lamp replacement, typically at the rear when mounted in an overhead location.

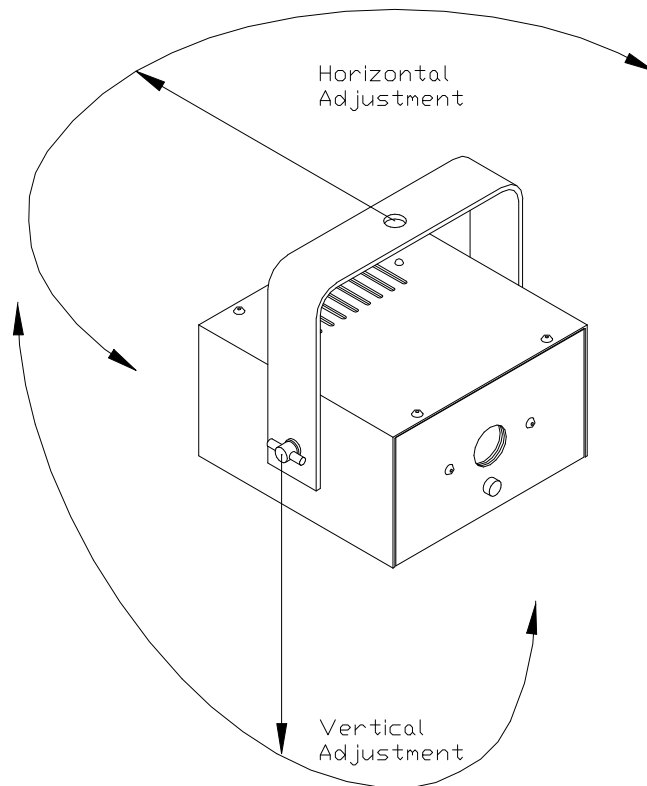
The WaveLight incorporates a mounting yoke with a 1/2" hole at the center for hanging the instrument. The WaveLight is normally attached to a mounting "C-clamp" or other stable means of support using the yoke mounting hole and an appropriate bolt and washer. The user is responsible for mounting the instrument 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.

Operation

Once connected to the ballast transformer, the WaveLight unit will operate as soon as AC power is applied to the ballast. The lamp and internal motors will begin to operate immediately, and the unit will project a moving pattern of light with an irregular character resembling the appearance of light reflected off of a surface of water, or underwater light transmitted through a water surface. The fixture is rated for continuous operation, and in normal use the unit will continue to display the output pattern until power is removed.

Aiming

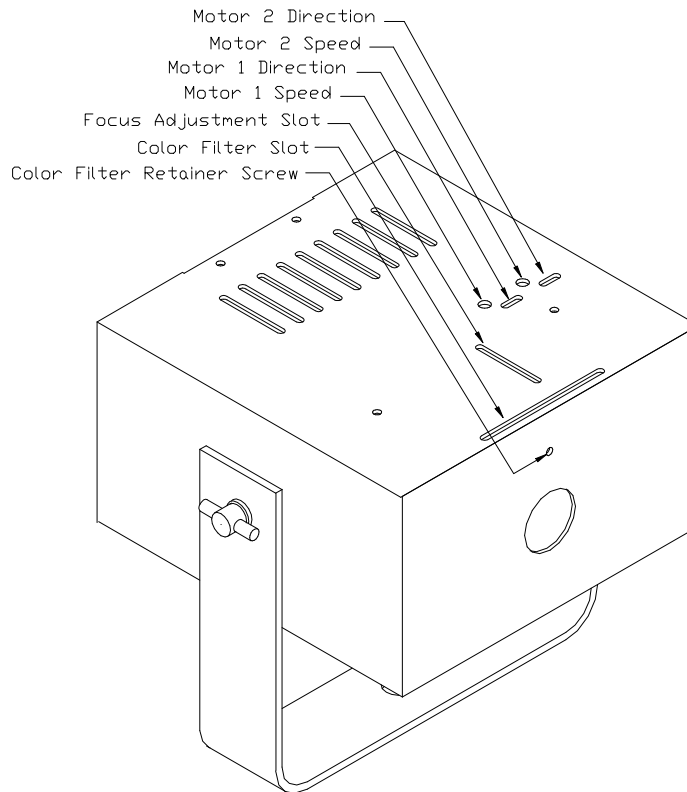
The instrument can be pointed using the mounting hole on the yoke as a directional pivot, typically in the horizontal or lateral direction. Tightening the mounting fastener will lock the instrument in that axis. The mounting yoke attaches to the sides of the instrument with two thumbscrews. Loosening the thumbscrews allows for adjustment of the instrument in the second axis, typically in the vertical or elevation direction. Tightening the yoke thumbscrews will lock the elevation axis.



Effect Adjustments

All controls which vary the appearance of the effect for focus, speed and direction are accessible at the bottom of the unit, as is the slot for installing a color filter or gel. The screw which secures the color filter is accessible at the front of the unit near the lens aperture.

The adjustment screws for effect focus and the gel retainer are small thumbscrews, which can be adjusted manually without tools. The controls for motor speed are multi-turn potentiometers accessible through holes in the case bottom.. The motor direction controls are slide switches also accessible through slots in the bottom. These controls can be adjusted using a small slot-blade screwdriver without opening the unit case.



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 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. A thumbscrew at the front of the unit retains the filter or gel. Deep color gels may fade or bleach with time, and may require periodic replacement to maintain the desired color. 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.

To install a color filter, disconnect power to the unit, remove the thumbscrew next to the output port, and slide the filter into the slot in the case 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, then aim and focus the unit as needed for normal operation.

Changing Motor Speed

The two motor speed controls are used to adjust the rate of motion in the output pattern. The motor speed controls are accessible through small holes in the bottom of the fixture using a small slot blade screwdriver. Rotating the controls clockwise increases the 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 further speed change at minimum or maximum settings.

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 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 through slots adjacent to the holes for motor speed adjustment on the bottom 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 slide to the opposite position. 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 in the same direction. Due to the side by side arrangement of the effect wheels, this produces overlapping motion in opposite directions. With the motors at nearly equal speeds, the motion adds up to look like neutral waves with no directional flow. If the speed of one motor is increased slightly, the pattern will begin to favor motion in one direction. Changing the direction of one motor will alter the pattern so that the direction of the effect motion will be strongly upward or downward. Reversing both motors will again result in neutral motion. If the resulting motion is not in the desired direction, i.e. down when you want up, such as when the fixture is mounted inverted, 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.

Dimming

The standard 120 volt WaveLight power supply is compatible with any dimming system that can accept an electronic ballast, and the small inductive component from the ballast as a load. If you are not certain that your dimmer can accept this type of load, consult the dimmer specifications or the manufacturer. The effect motor speeds will remain generally constant, and should not vary as the lamp is dimmed over a large range. The effect drive motors will not operate, and may not start, at the lowest dimmer settings. Some lamp glow may occur at the minimum dimmer settings which will permit the motors to operate normally. WaveLight units equipped with "Universal Voltage" DC power supplies cannot be used with dimming circuits.

Lamp Replacement

The installation of correct replacement lamps is essential to maintaining the correct appearance of the effect, and to continued safe operation of the fixture. Replacement lamps with incorrect properties, such as wide angle or flood output patterns, will result in a dim and badly focused image. Replacement lamps with incorrect wattage or voltage ratings may cause damage to the fixture.

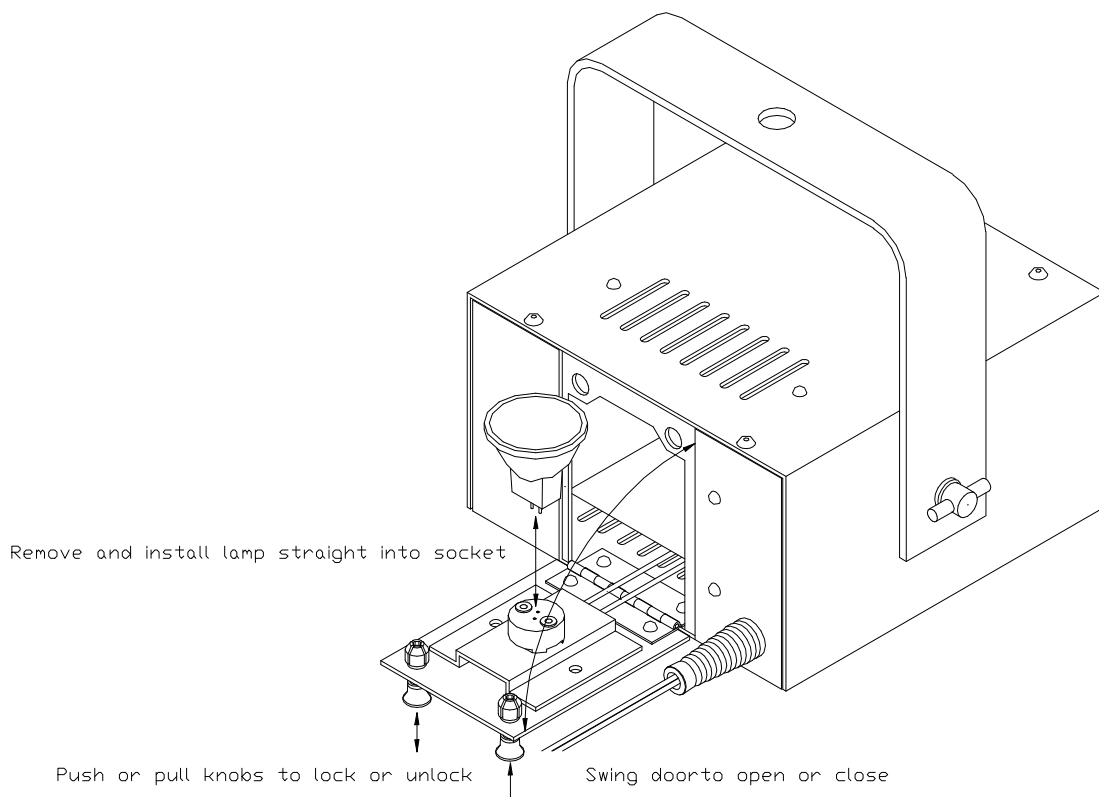
To change the lamp in the WaveLight, first remove power from the unit by unplugging the power cord from the unit, or at the AC power source. If the unit is mounted close to high wattage fixtures, or if the lamp has recently failed, the housing, lamp door, lamp, and other internal components will be hot. Allow the unit to cool for a while before attempting to change the lamp.

WARNING

The direct lamp output is very intense, and when powered, the lamp will become hot very rapidly and may cause burns if touched. Flammable material in contact with or in close proximity to the lamp may be ignited by lamp output, causing risk of fire which can potentially result in serious injury or death. For your safety, never attempt to change the lamp unless you are certain that power is not applied, and do not attempt to operate the unit with the lamp door, or the unit cover open.

The lamp is accessible through a hinged door located at the rear of the fixture. It is usually not necessary to disturb the fixture alignment to change the lamp. Unlatch the door by pulling outward on the two snap latch knobs at the top of the door. The latches operate in a pull/push manner, not by rotating the latch pins. After both latches are in the out and unlatched position, use the latch knobs to gently pull the hinged panel open. The access panel will swing open more than 180 degrees, and should not be forced further.

The lamp and lamp socket are attached to the lamp door and will be exposed as the door opens. Be sure the lamp is cool before touching or attempting to remove it. Support the lamp door and remove the lamp by grasping the reflector and gently rocking and pulling it straight out of the lamp socket.



CAUTION

Use of the proper type of lamp is essential to the safe and proper operation of the WaveLight. Do not install any replacement lamps greater than 35 watts at 12 volts, or any lamps rated for other than 12 volt use. For general replacement purposes, use only the recommended 35 watt narrow beam MR-11 lamps meeting ANSI specification FTE, or 20 watt narrow beam MR-11 lamps meeting ANSI specification FTB. Other lamp types, such as colored lamps may be acceptable, but for best results use only narrow beam lamps. Never exceed the maximum lamp wattage of 35 watts.

Make certain the unit is not powered before installing a replacement lamp. Remove the replacement lamp from its packaging, and confirm that it is a 12 volt FTE, FTB, or other suitable replacement type. Handle only the outer edges of the reflector, do not touch the lamp capsule inside the reflector. Install the new replacement lamp by aligning the body of the lamp to face straight away from the face of the socket, and the lamp pins to align with the holes in the ceramic lamp socket. Press the lamp straight into the socket until it is fully seated and centered to point straight away from the face of the socket and the lamp door. Do not twist the lamp during installation or the lamp and socket could be damaged.

Before closing the lamp door, make sure that both latch knobs remain pulled out in the unlatched position. The lamp door will not close if either of the latches is in the latched position. Some resistance may be felt as the latches dock into the socket holes on the fixture, but if the door fails to close fully, check that both latch pins are pulled out to the unlatched position. After the door is closed flush with the housing, push in on the latch pins until they snap to the inner and locked position to secure the door. Reconnect the power cord if disconnected, and apply power to the unit. Observe the fixture for normal operation, and make any aim or focus adjustments needed for best operation.

Maintenance

The primary maintenance required by the fixture will be lamp replacement. Typical lamp life should be in the range of 2000 hours with the standard 35 watt FTE lamps recommended. Longer lifetimes may be obtained with specialty or lower wattage lamps, but the fixture output may be reduced when lower wattage lamps are used. Colored lamps typically have shorter lifetimes than standard white replacements.

The two DC effect drive gearmotors installed in the unit 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.

Aside from lamp replacement, the only maintenance recommended is a periodic cleaning to remove dust accumulation from the fixture. Convection heat will draw air through the fixture, and dust will eventually build up outside and inside the fixture over time. Heavy accumulations of dust will reduce the fixture output, and may eventually obstruct the airflow through the unit, resulting in increased temperatures and reduced lamp lifetimes. Periodic cleaning with compressed air will remove most light dust contamination. Heavy dust contamination may require removal of the fixture outer cover for more thorough cleaning using compressed air, aided by a soft dry brush or tissue paper. Severe contamination by dust in combination with water mist, fog, and oil 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 interior and optical surfaces of the fixture. Proper cleaning and a fresh lamp will generally restore the fixture to its original performance.

Warranty

The Wavelight model WVL-1 fixture excluding the lamp has a one year warranty from the date of purchase against defects in materials, components, or construction. Precision Projection Systems will repair or replace any fixture which fails within this period at no cost to the user. This warranty does not cover fixtures which have been damaged by outdoor use, by application of incorrect voltage, or installation of incorrect lamps, nor those which have been modified or mechanically damaged. Refer to the following section to resolve common problems before contacting PPS for warranty service.

Troubleshooting

Problem

Probable Cause

Fixture completely inoperative

No line voltage power, or dimmer setting at minimum
 Fixture power cord or ballast power cord unplugged
 Defective 12 volt ballast or DC power supply

Motors operate normally,
 but no lamp output

Defective lamp, lamp not properly installed, or
 wrong voltage lamp

Lamp operates normally,
 but no effect motion

Incorrect DC polarity when operating the fixture
 with a DC power supply

Weak or uneven output pattern

Fixture focus set incorrectly
 Incorrect lamp type (wide angle) installed
 Defective lamp with poor pattern uniformity
 Fixture optics dirty or damaged

Jerky pattern motion, or directional motion.

Motor speed set too low for reliable motor operation
 Fixture effect wheel loose or jammed
 Defective effect wheel gearmotor

Fixture buzz or excessive noise

Some hum and quiet buzzing sound is normal
 Worn or defective effect wheel gearmotor

Replacement lamp cannot be installed

Lamp or lamp socket damaged or defective
 Incorrect Lamp type

Fixture is excessively hot

High ambient temperature at fixture location
 Ventilation slots blocked or obstructed

Schematic Diagram

