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***IMP 2.6<sup>TM</sup>***  
***cdm***  
***image marketing projector<sup>TM</sup>***

**User Manual**



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It is necessary to obtain a Return Material Authorization (RMA) number from your dealer or point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer's warranty.

Any Product unit or parts returned to High End Systems must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with an RMA number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction. Ship returned Product units or parts to: 2227 West Braker Lane, Austin, TX 78758 USA.

**Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.**

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All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the Continental United States.

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Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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## ***Introduction***

Congratulations on purchasing your new Lightwave Research® IMP 2.6 cdm fixture. We have endeavored to design quality and reliability to offer you an advanced fully intelligent DMX-512 fixture with on board controller that will give you optimal results. These units are extremely advanced for their size and price. We strongly recommend that you take time to read this manual fully before you attempt to use the fixture.

The fixture can run from its own internal controller, or from an external DMX512 controller.

The optical system was designed by computer CAD/CAM for optimal results and maximum light output. Aesthetics were not sacrificed, and the modern modular body has been designed on the latest 3D systems.

Once again we would like to thank you for purchasing the fixture and we are sure that it will provide you with easy operation and tremendous control power.

## ***Safety Points***

### **SAFETY FIRST !**

**Lethal voltages and high temperatures exist inside the fixture and must be only serviced by qualified personnel as outlined in the technical manual.**

Please read and take note of all the safety warnings below before use or installation.

**Caution** - Always leave the fixture to cool down before removing the lid, with special regard to the lamp chamber. A minimum of 30 minutes is advised.

**Caution** - Remove all mains power to the unit before servicing as lethal voltages are present.

**Caution** - Never power the unit up without protection from the lamp as ultraviolet radiation can be present.

**Caution** - This unit should be allowed to cool for 30 minutes before moving or opening.

**Caution** - Internal temperature can reach 600°C (1112° F)

## Specific Cautions

- 1) Read these instructions
- 2) Keep these instructions
- 3) Heed all warnings
- 4) Follow the instructions
- 5) Do not use this apparatus near water
- 6) Clean the fixture only with a damp cloth, use a dry cloth on the optics.
- 7) Do not block any of the ventilation openings in the case.
- 8) Do not install near heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the grounding plug. A grounding plug has two blades and a third grounding prong. The third prong is provided for your safety. When the third prong does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- 11) Use only attachments / accessories supplied by the manufacturer.
- 12) Use only the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.
- 13) Unplug the apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as power supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate, or has been dropped.
- 15) Do not look directly at the lamp.
- 16) Use only the components provided with the fixture to attach the handle. Safety chains should be attached to the metal tab on the under side of the fixture, and must be capable of handling at least six times the mass of the fixture.
- 17) A suitably rated power cord set complying with the requirements of UL 817, type SVT or SJT, 18AWG VW-1, with a minimum length of 1.5 m (4.9 ft) must be used. The power supply spur / branch feeding the equipment must be individually fused to suit the power consumption of the fixture. (See the power consumption rating on the equipment label).
- 18) If in use with an external controller or as a master unit to drive other lights, suitable data cable conforming to the DMX standard (USITT DMX512 / 1990) must be used to conform to current CE legislation.
- 19) Do not mount the fixture near curtains or any flammable objects.
- 20) Do not use if ambient (room) temperature is below 10°C (50°F) or above 40°C (104°F). The IP rating of this product is 20. Overall enclosure complies with flame retardancy UL94 5VB & CTI>175.
- 21) This equipment is for indoor use only and must be allowed to cool before moving.

## Lamp and Gobo Replacement

Your unit comes complete with the lamp already fitted and optimized. Lamp replacement must be performed by qualified service personnel only, as specified in the technical manual.

The unit is supplied without gobos fitted. To install these, refer the unit to qualified service personnel that have access to the technical manual.

## LA SÉCURITÉ AVANT TOUT!

**Attention au danger des hautes tensions et des températures élevées à l'intérieur de votre projecteur à effets lumineux. Confiez l'entretien à un personnel qualifié.**

## Recommandations Complémentaires

- 1) Lire ces recommandations
- 2) Conserver ces instructions
- 3) Tenir compte de tous les avertissements
- 4) Suivre les recommandations
- 5) Ne pas utiliser cet équipement à proximité d'eau
- 6) Nettoyer l'appareil uniquement à l'aide d'un chiffon humide, utiliser un chiffon sec pour les parties optiques.
- 7) Ne pas obstruer les ouvertures de ventilation sur le bloc de l'appareil.
- 8) Ne pas installer près de sources de chaleur tels que radiateurs de chauffage ou autres équipements (comme les amplificateurs par exemple) pouvant produire de la chaleur.
- 9) Ne pas détourner l'objectif de sécurité des prises de terre Une prise de terre est composée de deux lames et d'une pointe. Cette pointe est là pour votre sécurité. Si elle ne correspond pas à votre prise de connexion faites appel à un électricien pour le remplacement de l'ancienne prise.
- 10) Évitez que l'on marche sur le câble d'alimentation ou que l'on tire les prises et sur les sorties de câbles de l'appareil.
- 11) N'utilisez que les ustensiles de transports, stands, trépieds, crochets d'attaches ou tables préconisés par le fabricant ou vendus avec l'équipement. Lors du transport de l'appareil soyez prudents afin de ne pas provoquer de dommages en cas de renversement de l'appareil.
- 12) N'utilisez que les accessoires de fixations par le fabricant.
- 13) Adressez-vous au personnel qualifié pour le service après-vente. Des réparations sont nécessaires si l'appareil a été endommagé d'une manière ou d'une autre par exemple si un câble d'alimentation ou une prise ont été abîmés un liquide a coulé ou des objets sont tombés à l'intérieur de l'appareil l'appareil est resté sous la pluie ou dans l'humidité si l'appareil ne fonctionne pas ou est tombé.
- 14) Débranchez l'appareil en cas d'orages ou de non utilisation prolongée.
- 15) Ne pas regarder directement la lampe.
- 16) Votre appareil est déjà équipé une lampe adaptée et optimisée. Le remplacement de la lampe ne pourra être effectué que par une personne dûment qualifiée et en se référant au manuel d'instructions techniques.
- 17) N'utilisez que les éléments de fixation fournis pour attacher la fixation à la partie fixe. Les chaînes de sécurité devront être attachées à la patte métallique à l'appareil et doivent être capables de

supporter le poids de l'appareil. Si vous bougez les supports de fixation, ne serrez pas trop fort les goujons de fixation lors de la remise en place des éléments.

- 18) L'appareil ne doit pas être installé à proximité de réseaux ou objets inflammables.
- 19) Ne pas utiliser l'équipement à des températures inférieures à 20°C ou supérieures à 40°C. Le taux IP de ce produit est de 20. Le bloc complet est en conformité avec un ralentissement de la propagation de la chaleur des flammes UL94 5V & CTI > 175.
- 20) Cet appareil; est prévu uniquement pour une utilisation à l'intérieur, et doit être refroidi avant tout déplacement.
- 21) Si l'effet doit être mobile, lors de l'installation, suivez les recommandations ci-dessus, assurez-vous que les câbles sont connectés en toute sécurité et que l'appareil est fixé correctement au dessus de la hauteur des têtes.

## ***Preparing to Use the Fixture***

Before programming the fixture, power it up as follows:

1. Locate the programming panel at the side of the unit.  
The programming panel is an LED display and 4 buttons.
2. Turn the unit on.
3. Wait while the unit sets up. This involves some noise and mirror movement.  
(During warm-up, the display shows the model number, then the default DMX starting channel (c998). Once the fixture has warmed up, the display blanks. You are then ready to begin programming.)

## **Moving the Fixture Later**

**If you move the fixture to another venue, follow the instructions in "Safety Points" on page 3 and make sure the cables are routed in a safe manner. Also make sure the fixture is mounted securely above head height.**

## **Hanging the Fixture**

To hang the fixture:

1. Install a 'C' clamp to the yoke through the ½ in (13 mm) hole. The fixture is now ready for permanent installation.
2. Hang the fixture and position it as necessary.
3. When the required angle is reached, lock the fixture in place with the thumbscrew.

The recommended mounting position is  $\pm 60^\circ$  from vertical (connectors at bottom). This mounting position will help assure a longer lamp life.

# Operating the Fixture

To operate the fixture:

1. Program its basic operation as discussed in the next section.
2. Operate it in one of the following ways:
  - **Self-control mode:** Using the fixture's onboard controller to create a 10-step sequence as discussed on page 8.
  - **Controller:** Using a DMX 512 compatible controller, such as the Power Cue DMX, as discussed on page 10.

## Programming the Fixture

You program the fixture using the four keys located by the DMX connectors near the rear of the fixture. Programming choices are indicated on the one-character LED display. Following is a list of the symbols and their functions:

c	DMX 512 Channel number, or color selection
g	Select a gobo pattern
I	INVERT (invert on pan or tilt motors)
p	PAN movement of the mirror (horizontal)
t	TILT movement of the mirror (vertical)
h	Hold time between programs
r	RATE, used to set the speed between each step of the programmed sequence.
L	LOCK (disables program saving)

The keys are defined as:

**MODE** – press to accept or select a mode

**SELECT** – Scrolls between options in the selected mode

↑ (**UP**) / ↓ (**DOWN**) – changes modes, or adjusts the value of the selected option

### Setting the DMX Start Channel

To alter the DMX channel quickly (if the desired channel is close to the current channel), press either the ↑ or ↓ key to display the channel number. While it is flashing across the display, press either the ↑ or ↓ increase or decrease the number.

**Note:** To use the fixture in local mode, set the DMX starting channel to c998 (its default setting).

To set the fixture to any DMX channel:

1. Toggle to the c option using the **MODE** key.
2. Press **SELECT**.  
Each subsequent press of the **SELECT** key will show h (hundreds), t (tens) and u (units).
3. When you have selected a value to alter, press either the ↑ or ↓ to change the value.
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.



## Inverting the Pan and Tilt Movement

This option allows you to invert the pan and tilt mirror motor movement. (Most controllers are capable of doing this automatically, so consult the documentation provided with the controller you are using.)

To invert the pan and tilt motor movement:

1. Toggle to the **I** option using the **MODE** key.
2. Toggle to one of the following options using the **SELECT** key:
  - **P** indicates pan movement
  - **t** indicates tilt movement.
3. Press the **↑** or **↓** key until one of the following appears in the display:
  - **y** indicates inverted movement.
  - **n** indicates normal movement.
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.

## Setting the Programming Lock

The programming lock prevents accidental / unauthorized programming of options or channel selection. If this is active, the first press of the **MODE** key will display **L** to indicate the lock has to be removed before programming.

To lock / unlock the fixture:

1. Press the **MODE** key until **L** appears in the display.
2. Press **SELECT**.
3. Press the **↑** or **↓** key until one of the following appears in the display:
  - **n** unlocks programming
  - **L** locks programming
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.

## Using Self-Control Mode

This section discusses how to create or edit a one to 10-step sequence using the fixture's onboard controller. You can optionally link additional IMP 2.6 cdm fixtures, which mimic the movements of the "master" fixture, as discussed in "Linking Fixtures" on page 10.

### Creating a Sequence

To create a 10-step sequence:

1. Make sure programming is not locked, as discussed in the previous section.
2. Set the DMX start channel to **c998**, as discussed in "Setting the DMX Start Channel" on page 7.  

This is the *master* fixture, which can be used alone or linked to other fixtures, as discussed in "Linking Fixtures" on page 10.
3. Press the **MODE** key until the display shows **0** (the first of 10 available steps in the sequence).

For each of the 10 steps in the sequence, you have the following options:

- Pressing **SELECT** toggles through the four programming options: *g* (gobo select), *c* (color select), *p* (pan angle select), and *t* (tilt angle select).
  - Pressing the  $\uparrow$  or  $\downarrow$  keys toggles through positions for each programming option. For example, pressing the  $\uparrow$  or  $\downarrow$  keys when *g* (gobo) is selected toggles through gobo wheel positions.
  - Pressing **MODE** after the last programming option moves to the next step in the sequence.
4. If the previous step is the last in the sequence, toggle the **SELECT** key to the *g* option and press the  $\downarrow$  key until there is no light output.  
This sets the end of sequence marker.
  5. To set the hold interval between steps, keep pressing the **MODE** key until *h* (hold time) is displayed.
  6. Use the  $\uparrow$  or  $\downarrow$  keys to select one of the following:
    - 0 0 seconds, no holding time (unless the rate is set at 9, then time is 1 second)
    - 1 1 second
    - 2 2 seconds
    - 3 5 seconds
    - 4 10 seconds
    - 5 15 seconds
    - 6 20 seconds
    - 7 30 seconds
    - 8 60 seconds (1 minute)
    - 9 120 seconds (2 minutes)
  7. To set the rate of change between steps, press the **MODE** key.  
The display shows *r* (rate).
  8. Use the  $\uparrow$  or  $\downarrow$  keys to select one of the following:
    - 0 Slow sweeping movements of the light beam.  
:  
:
    - 4 Medium speed sweeping movements of the light beam.  
:  
:
    - 8 Fast sweeping movements of the light beam.
    - 9 Mirror moves quickly, beam shuttered during movement.
  9. Press the **MODE** key to exit programming mode and start the sequence. Please note the sequence may take up to 2 minutes to start.

## Editing a Sequence

To edit one or more steps of a sequence:

1. Keep pressing the **MODE** key until the number of the step you want to edit displays.
2. Press the **SELECT** key to edit the step.
3. Edit the step as discussed in "Creating a Sequence" on page 8.
4. Either edit additional scenes, edit the hold time, edit the rate, or keep pressing the **MODE** key until the sequence starts.

## Linking Fixtures in Self-Control Mode

This section discusses how to link additional fixtures to the master fixture you programmed in the previous section. These *slave* fixtures mimic the one to 10-step sequence you previously programmed.

Only *IMP 2.6 cdm fixtures* may be placed on the link. Do not link other fixtures on the same link.

To link additional fixtures in self-control mode:

1. Program the master fixture as discussed in "Creating a Sequence" on page 8.
2. Place a terminator in the female DMX "out" connector of the last fixture (a 100 ohm resistor between pins 2 and 3).
3. Set all other fixtures to DMX channel c000.

## Controlling the Fixtures with a DMX Controller

To control the fixtures using a DMX controller (such as the Power Cue DMX™), first assign each fixture a unique DMX start channel, as discussed in "Setting the DMX Start Channel" on page 7. Consult the documentation provided with your DMX controller for details about its operation.

### Pan and Tilt Settings

1. The first DMX channel (the *base* channel) sets Pan movement. Base + 1 sets Tilt movement. Positions/velocities are derived from a single DMX channel per axis. There is no need for separate velocity sliders due to advanced velocity prediction software.
2. If you wish to move the pan at a specific velocity, get the controller to do a crossfade chase from a scene containing the start position to a scene containing the finish position.

### Gobo Settings

Base + 2 sets gobo. DMX value ranges are shown below:

DMX range	Selection
0-64	Apperture (full open)
65-96	Cyan Fibroid
97-128	Radium
129-160	OPEN
161-192	SALE
193-255	Autumn breakup

### Color Settings

Base + 3 sets color. DMX value ranges are shown below:

DMX range	Selection
0-31	Open
32-63	Cyan
64-95	Yellow
96-127	Lime green
128-159	Orange
160-191	Hot pink
192-255	Medium blue

## Shutter Settings

Base + 4 sets shutter. DMX value ranges are shown below:

DMX range	Selection
0-2	Blackout
3-48	Full open
49-96	Fresnel lens
97-128	Open
129-255	Scroll, full open fresnel lens-blackout-open

## Special Functions

This section lists DMX values for special functions available on all fixtures.

Function	DMX Values
Home / reset all motors	Value of 001 on all channels for 4 seconds
Put fixtures in self control mode	Value of 255 on all channels
Revert from self control mode to controller mode	Reduce value of any DMX channel from 255 to below 210

## Troubleshooting

This section discusses general troubleshooting suggestions. Consult the separate technical reference (or contact High End Systems) for more technical information.

The case may be cleaned with a dry cleaning cloth. Should it be necessary to use a cleaning compound on the case, it is important to use a non-abrasive, non-bleaching, solvent-free cleaning compound which leaves no residue.

Special care must be taken when cleaning the lens and mirror. Avoid touching any of the optical elements in the head with your fingers. This unit must not be immersed in water.

The following table lists other common problems and their solution:

FAULT	CHECK
Fixture does not turn on	Check power line connection. If still not functioning, contact High End Systems.
Output power seems low	Make sure the mirror and the (removable) front lens is clean.
Fixture does not run in self control mode.	Check the DMX channel of the master fixture is set to c998. Check a program has been entered into the fixture. Wait two minutes for any programming changes to take effect.
Fixture does not respond to DMX signal	Check the cable from the controller and along the chain. Look for bad connections and bad cables.  Make sure a terminator is installed on the female DMX "out" port of the last fixture in the link. (Put a 100 ohm resistor across pins 2 & 3 of the XLR connector).  Check controller is sending a DMX signal.
Fixture turns on but lamp does not turn on.	Contact High End Systems.

## **Specifications**

**Lamp:** Philips CDM-T150/942

**Reflector :** Custom made, polished aluminium multifaceted reflectors are used to ensure good even light spread across the beam.

**Design :** Originally designed and computer optimized optical system results in 50% higher output compared to other brand projectors.

**Lenses :** Top quality white crown glass lenses for maximum clarity with IR coating. 2 plano-convex lenses are used.

**Mirror :** High quality front surface mirror for maximum reflectivity on scanners.

**Beam angle :** 15.4 degrees with the standard lens.

### **MOVEMENTS**

The position and velocity for each motor is defined from a single standard 8 bit DMX channel using special prediction software. This allows for easy tracking as separate velocity channels are not required. The gobo wheel is a full wheel with a 340° selectable motion and 6 positions for custom gobos. The shutter closes automatically during gobo change and also has a fresnel lens facility for color washing.

PAN: 165 degrees, >2900 step accuracy

TILT: 114 degrees, >1000 step accuracy

GOBO: 340° movement, half stepped.

SHUTTER: Half stepped movement.

COLOR: 340° movement, microstepped.

### **MECHANICAL SPECIFICATIONS**

Motors : Type 17 stepper motor, custom designed (one per channel).

Construction : Injection moulded thermo-polymer, high tolerance housing.

Cooling : Custom fan with special long life sleeve bearings for prolonged running times.

Operating position : Lamp near vertical  $\pm 60^\circ$  ,must be mounted with connectors at bottom and mirror at top.

Finish : Color impregnated thermo-polymer with spark finish.

Mounting : Yoke with plastic locking bolts for clamping into final position.

Mass : 8.3Kg

Dimensions Imp (excluding carton) : 495mm(19.5") x 255mm(10") x 200mm(7.9")

### **ELECTRONICS**

A great deal of research over many years has produced a very compact and reliable microprocessor board. Experience gained from Automotive and Military industries has been applied to ensure a long lasting product. The board can be programmed with a sequence which is retained in memory (with 40 year back-up) or used with an external controller with DMX512 1990/91 protocol (any address in the 512 range). Two 3 pin XLR connectors are provided (1 Plug, 1 Socket) to allow the unit to be easily daisy chained. An internal green LED indicates the logic supply is present. This equipment must be earthed.

## **Safety**

The unit features 4 fuses for ultimate protection, 3 are standard types protecting individual parts and 1 is thermal sensing to protect the equipment if the fan or vents are blocked. The steel mounting handle is bolted through the main chassis and the steel base plate and features hand operated locking bolts for easy positioning.

## **Technical and Maintenance Section**

### **CAUTION**

**For use by qualified service personnel only**

### **Lethal voltages and high temperatures exist inside the fixture. The fixture must be serviced by qualified personnel only.**

This section discusses the following maintenance procedures:

- Cleaning the fan
- Replacing the power supply fuse
- Replacing and optimizing a lamp

### **GENERAL INSTRUCTIONS**

Caution - These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock do not perform any servicing other than contained in the operating instructions unless you are qualified to do so. refer all servicing to qualified personnel.

Some important points when servicing or installing effects lighting equipment.

Caution - Always leave the fitting to cool down before removing the lid, with special regard to the lamp chamber. A minimum of 30 minutes is advised.

Caution - Remove all mains power to the unit before servicing as lethal voltages are present.

Caution - Never power the unit up without protection from the lamp as UVA and UVB radiation can be present.

Caution - This unit should be allowed to cool for 30 minutes before moving.

Caution - Internal temperature can reach 600°C (1112°F)

Always remove the fixture from its mounted position and never attempt to service the equipment while in situation.

Always use the mounting hardware provided and ensure that all locking washers are in fitted in place.

Do not install the unit near curtains or anything flammable.

Ensure the unit is earthed (class 1 product).

Observe connection ports and use only the correct connectors.

Never bypass any of the safety mechanisms built into the unit.

Ensure that ambient temperature (room) is between 10 °C and 40 °C. The IP rating of these products is 20.

This equipment is for indoor use only.

If you are unsure about any aspect of the unit, seek advice before continuing.

Caution - Risk of electric shock, do not open.

## RECOMMANDATIONS GÉNÉRALES

Attention. Ces indications de réparations ne s'adressent qu'au personnel qualifié. Pour éviter les risques de décharges électriques, n'effectuez pas de réparations autres que celles présentées dans le mode d'emploi sauf si vous êtes qualifiés pour le faire. Adressez-vous aux spécialistes pour toute autre intervention.

Quelques points importants lors de l'installation ou de la réparation de projecteurs lumières à effets:

Attention. Laissez toujours refroidir l'équipement avant d'ouvrir l'appareil, en faisant particulièrement attention à la partie de l'appareil contenant la lampe. Un minimum de 30 minutes d'attente est conseillé.

Attention. Coupez toute alimentation électrique connectée à l'appareil avant une intervention pour éviter des problèmes électriques.

Attention. Ne mettez jamais l'appareil en route sans protection au niveau de la lampe car des radiations UVA et UVB peuvent se produire.

Attention. Cet appareil doit être refroidi pendant 30 minutes avant tout déplacement.

Attention. La température interne peut atteindre 600°C.

Enlevez toujours la partie fixe de sa position initiale d'utilisation, et n'essayez pas de réparer l'appareil en cours d'utilisation.

Utilisez toujours le matériel de fixation fourni et assurez-vous que toutes les rondelles de fixation sont à leur place.

N'installez pas l'appareil près de rideaux ou de quelque objet inflammable que ce soit.

Assurez-vous que l'appareil est connecté à la terre (produit de catégorie I)

Vérifiez les connexions et utilisez uniquement des connexions adaptées.

Ne jamais court-circuiter les mécanismes de sécurité internes de l'appareil.

Assurez-vous que la température ambiante est située entre 10°C et 40°C. Le taux IP de ce produit est de 20.

Cet équipement est prévu uniquement pour une utilisation à l'intérieur.

Si vous n'êtes pas sûr d'un des éléments de l'appareil, renseignez-vous avant de continuer.

Attention. Risque de décharges électriques, ne pas ouvrir.

### Cleaning the Fan

Every three to six months, if necessary to remove built-up dust and dirt from the fan, you can clean them using a low-pressure compressed air source. You must place an object (*not your fingers!*), such as a pen or a screwdriver, into the fan fins to prevent them from spinning while you are blowing air into them. *Allowing the fan to spin can result in severe damage.*

#### CAUTION

**Make sure the fan fins are held stationary. The fan can be severely damaged if they are allowed to spin with the force of compressed air.**

**Use *only* a low-pressure compressed air source (25 psi or lower).**

**To avoid personal injury, do not expose your eyes or skin to the direct jet of compressed air, since it can constitute a health hazard. Use suitable protection for your eyes and exposed skin.**

To clean the fans:

1. Disconnect power from the fixture, and allow it to cool.
2. Remove the power cord and any DMX cables from the fixture.
3. Place the fixture on a clean work surface in a position that allows you to access it easily. Make sure the fixture has cooled sufficiently to allow safe access (at least 30 minutes).
4. Loosen the lid by turning the three locking bolts (one on the identity label the other two on the rear end of the unit) counter-clockwise.
5. Remove the lid.
6. Hold the fan fins in place with an object (not your fingers!), such as a screwdriver or pen.
7. Observing the cautions above, use the low-pressure compressed air source to remove dust and dirt from the fan.
8. Make sure the compressed air is blowing dust and dirt out of the fixture, not into the fixture.
9. Replace the cover, DMX cables, and power cord.

## Replacing the Power Supply Fuse

*The fuse must be replaced with a fuse of the specified type and rating only. This is indicated on the label adjacent to the power connector.*

If the fixture fails to power up, and you have determined that it is attached to an appropriately-rated power source, you can examine the power supply fuse.

To replace the power supply fuse:

3. Disconnect power from the fixture, and allow it to cool.
4. Locate the fuse holder, molded into the power connector.
5. Remove the power cord from the fixture.
6. Remove the fuse holder with a small flat-blade screwdriver.
7. Gently remove the fuse from its holder and examine it.
8. If the fuse is damaged, replace it the same type only as indicated on the label adjacent to the power connector. Please be aware that there are two possible locations for the fuse to fit in the draw. The closest to the fixture is the correct location, the other is not used.

## Replacing a Lamp

This section discusses how to replace a lamp, and how to optimize the lamp. The replacement lamp type is Philips CDMT-150/942. For best performance, you *must* optimize a new lamp immediately after installing it.

To replace the lamp:

1. Disconnect power from the fixture, and allow it to cool.
2. Remove the power cord and any DMX cables from the fixture.
3. Place the fixture on a clean work surface in a position that allows you to access it easily.
4. Make sure the fixture has cooled sufficiently to allow safe access (allow 30 minutes).
5. Loosen the lid by turning the three locking bolts (one on the identity label the other two on the rear end of the unit) counter-clockwise.
6. Remove the lid.
7. Rotate the fixture so the lamp is closest to you, and the reflector is facing away.



8. With a small flat-blade screwdriver inserted between the base of the lamp and its holder, gently ease the old lamp out of its holder.
9. Push the lamp forward and twist the reflector to the side on its mounting springs.
10. Pull the lamp backward (toward the power connector) to remove it. The lamp holder may also be angled to allow easier removal.
11. Installing the new lamp is the reverse action of the above. Do not touch the quartz envelope of the lamp, and always handle it by the ceramic base.
12. Align the pins with the lamp holder and gently push the lamp in.
13. Make sure the internal quartz sphere has approximate 5mm (0.2 in) showing from the rear of the reflector for optimum power and is not off centre
14. Re-fit the case lid and make sure all case lid screws are replaced tightly.

### **Optimizing a Lamp**

Optimizing the lamp places the arc at the focal point of the reflector, and is necessary after either:

- You install a new lamp
- You notice a reduction in lamp output, or "hot spots" in the light beam

To optimize the lamp:

1. Make sure the case lid is properly installed.
2. Connect the fixture to an appropriately-rated power supply. (See the label adjacent to the power cord for details.)
3. Allow the fixture to home. After homing, the lamp strikes automatically.
4. Send the correct DMX command from a controller to select an open gobo and open color. Set the mirror to be midway on both pan and tilt. Ensure the shutter is fully open.
5. Orient the fixture so the beam will project onto a flat, white surface at least 10 ft (3 m) away.
6. Make sure the light beam is round, and not oval.
7. Manually turn the lens tube to focus the beam until its edge is sharp.
8. Locate the three optimizing Phillips screws, inset on the fixture's base.
9. Turn each screw until the beam is at its maximum brightness, and the light level is uniform across the beam. (Do not leave any "hot spots" in the beam.)

If you do not notice any difference, try fully loosening all three screws and individually retightening them.